Catalog

MCC-D-2009

Ceiling Concealed D Series

Models: MCC 075 D(R) - MCC 100 D(R)

McQuay® Air Conditioning

Engineered for flexibility and performance.™

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Note : Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.

Caution : Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

Warning : Moving machinery and electrical power hazard. May cause severe personnel injury or death. Disconnect and lock off power before servicing equipment.

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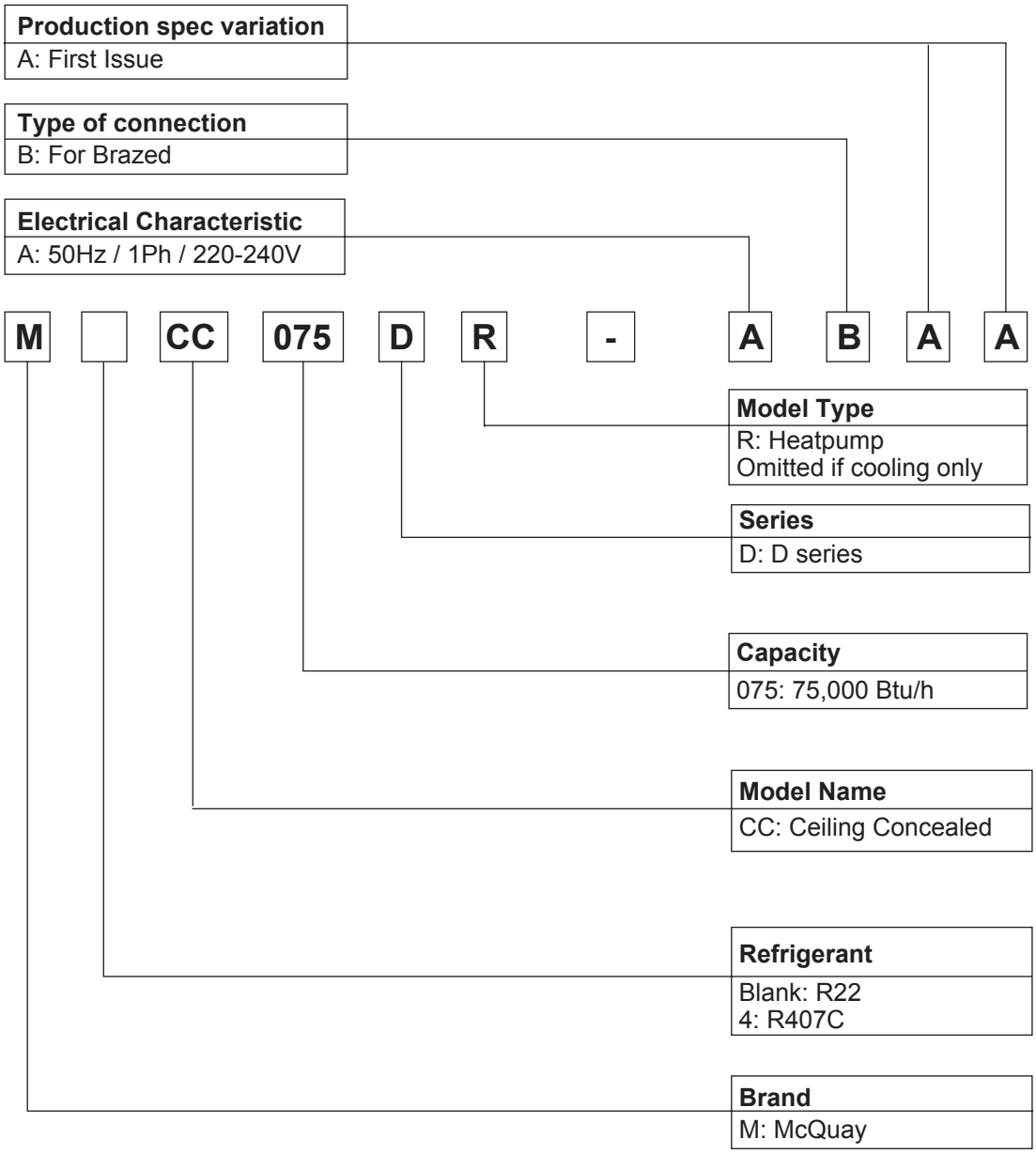
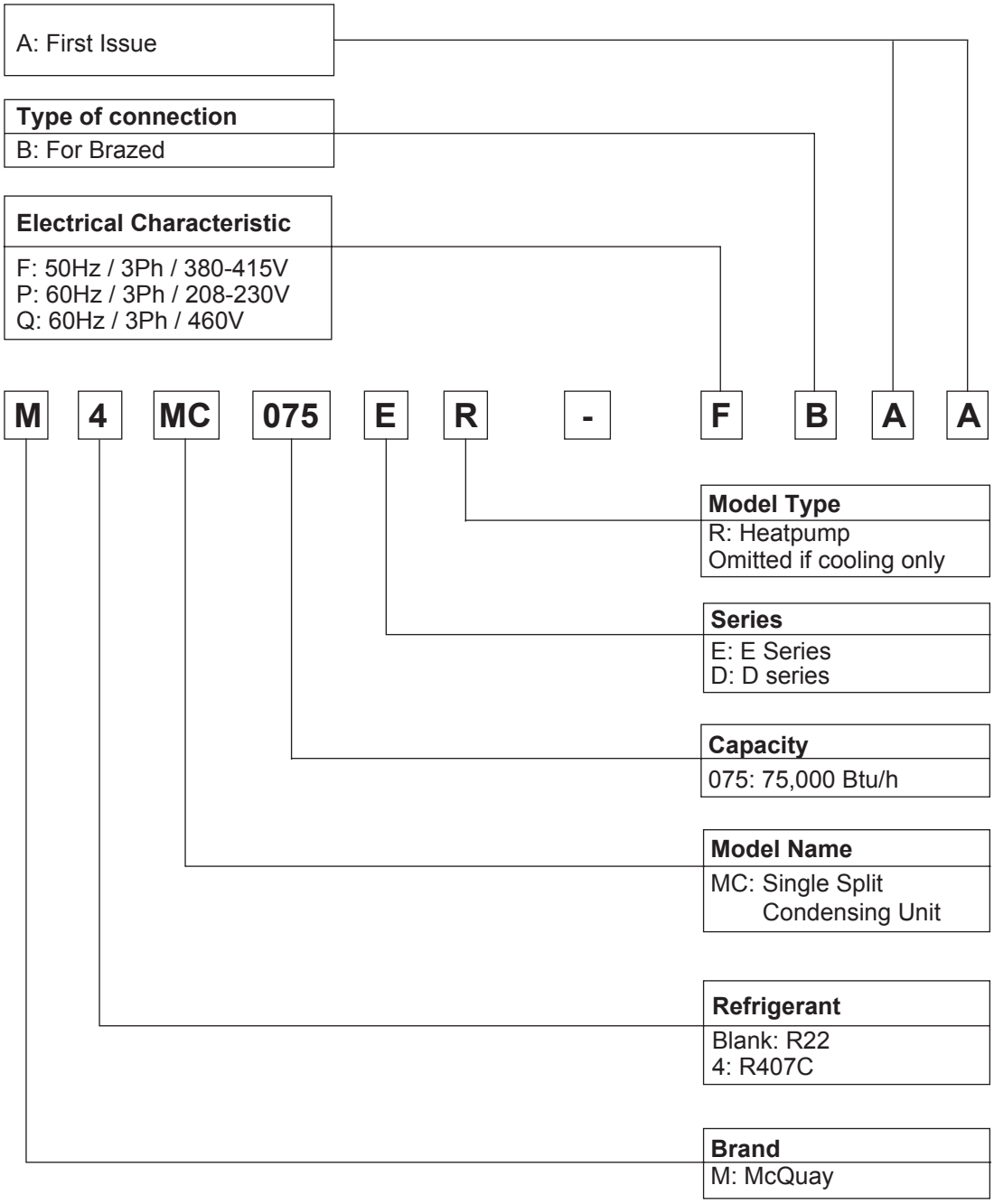
We reserve the right to change design and construction specifications at any time without notice.

CE

Nomenclature




A: First Issue
Type of connection
B: For Brazed
Electrical Characteristic
F: 50Hz / 3Ph / 380-415V
P: 60Hz / 3Ph / 208-230V
Q: 60Hz / 3Ph / 460V
M 4 MC 075 E R - F B A A
Model Type
R: Heatpump
Omitted if cooling only
Series
E: E Series
D: D series
Capacity
075: 75,000 Btu/h
Model Name
MC: Single Split
Condensing Unit
Refrigerant
Blank: R22
4: R407C
Brand
M: McQuay

Product Line-up

Indoor Unit MCC-D Series

MCC		NONMENCLATURE	Classification								
			Control	Handset	Marking	Refrigerant Control		Fin	With Air Filter	Level Switch	Built-in Filter Rail
			NETWARE 3	L2	CE Mark	Cap. Tube	TXV	ALUMINIUM (CORR.)			
Cooling Model	075D	ABAA	X	X	X		X	X	X	X	X
	100D	ABAA	X	X	X		X	X	X	X	X
Heat Pump Model	075DR	ABAA	X	X	X		X	X	X	X	X
	100DR	ABAA	X	X	X		X	X	X	X	X

Outdoor Unit
MMC-D Series Product Line Up

MMC		Nomenclature	Classification																		
			Controller					Marking			Compressor	Control Refrigerant	Others						Liquid Pipe Size (in)	Gas Pipe Size (in)
			With Contactor	Without Contactor	With 24Vac Control Circuit	With Auto HP/LP	With Manual HP/LP	CE Mark	ETL	Without Marking	Scroll-Copeland	TXV	Without Expansion Device	Rivet "Made In Malaysia"	With Accumulator	With Type Brazed Ball Valve	Phase Protector	Gold Fin (NA549)		
Cooling Only Model	075D	FBAF	X			X		X			X		X				X		1/2	1
		FBAG	X			X		X			X		X		X					
		FBAH	X			X		X			X		X	X						
		FCAA	X			X		X			X		X			X				
		FCAB	X			X		X			X		X		X	X				
		PBAB	X			X				X	X		X							
		PBAC	X		X	X			X		X		X					X		
		PCAA	X			X				X	X		X			X				
		QBAB	X			X				X	X		X							
		QBAC	X		X	X			X		X		X					X		
		QCAB	X		X	X				X	X		X		X	X				
	100D	FBAF	X			X		X			X		X				X		5/8	1-1/8
		FBAG	X			X		X			X		X		X					
		FBAH	X			X		X			X		X	X						
		FCAA	X			X		X			X		X			X				
		FCAB	X			X		X			X		X		X	X				
		PBAB	X			X				X	X		X							
		PBAC	X		X	X			X		X		X					X		
		PCAA	X			X				X	X		X			X				
		QBAB	X			X				X	X		X							
		QBAC	X		X	X			X		X		X					X		
		QCAB	X		X	X			X		X		X		X	X				

M4MC-D Series Product Line Up

M4MC		Nomenclature	Classification											
			Controller		Marking	Compressor	Control Refrigerant	Others					Liquid Pipe Size (in)	Gas pipe size (in)
			With Contactor	Auto HP/LP	CE Mark	Scroll-Copeland	TXV	Without Expansion Device	For Sequential Controller	With Accumulator	With Type Brazed Ball Valve	Gold Fin (NA549)		
Cooling Only Model	075D	FBAA	X	X	X	X		X	X				1/2	1
		FBAA	X	X	X	X		X	X	X				
		FCAA	X	X	X	X		X	X		X			
		FCAB	X	X	X	X		X	X	X	X	X		
	100D	FBAA	X	X	X	X		X	X				5/8	1-1/8
		FBAA	X	X	X	X		X	X	X				
		FCAA	X	X	X	X		X	X		X			
		FCAB	X	X	X	X		X	X	X	X	X		

Outdoor Unit

MMC-ER Series Product Line Up

MMC		Nomenclature	Classification													
			Controller		Marking	Compressor	Control Refrigerant		Others						Liquid Pipe Size (in)	Gas Pipe Size (in)
			With Contactor	With Auto HP/LP	CE Mark	Scroll-Copeland	TXV	Without Expansion Device	For Sequential Controller	Gold Fin (NA549)	Rivet "Made In Malaysia"	With Brazed Type Ball Valve	Check valve	Phase Sequencer		
HEATPUMP MODLES	075ER	FBAA	X	X	X	X	X		X						1/2	1
		FBAB	X	X	X	X	X		X	X						
		FBAC	X	X	X	X	X		X		X					
		FCAA	X	X	X	X	X		X			X				
	100ER	FBAA	X	X	X	X	X		X						5/8	1-1/8
		FBAB	X	X	X	X	X		X	X						
		FBAC	X	X	X	X	X		X		X					
		FCAA	X	X	X	X	X		X			X				
	125ER	FBAA	X	X	X	X	X		X						5/8	1-3/8
		FBAB	X	X	X	X	X		X	X						
		FBAC	X	X	X	X	X		X		X		X			
		FCAA	X	X	X	X	X		X			X				
	150ER	FBAA	X	X	X	X	X		X						5/8	1-3/8
		FBAB	X	X	X	X	X			X			X	X		
		FCAA	X	X	X	X	X		X			X				

M4MC-ER Series Product Line Up

M4MC		Nomenclature	Classification													
			Controller		Marking	Compressor	Control Refrigerant		Others						Liquid Pipe Size (in)	Gas Pipe Size (in)
			With Contactor	With Auto HP/LP	CE Mark	Scroll-Copeland	TXV	Without Expansion Device	For Sequential Controller	Gold Fin (NA549)	With Accumulator	With Brazed Type Ball Valve				
Heatpump Models	075ER	FBAA	X	X	X	X	X		X						1/2	1
		FCAA	X	X	X	X	X		X			X				
	100ER	FBAA	X	X	X	X	X		X						5/8	1-1/8
		FCAA	X	X	X	X	X		X			X				
	125ER	FBAA	X	X	X	X	X		X						5/8	1-3/8
		FCAA	X	X	X	X	X		X			X				
	150ER	FBAA	X	X	X	X	X		X						5/8	1-3/8
		FCAA	X	X	X	X	X		X			X				

Features

Invisible Operation
The unit is installed concealed above the ceiling. MCC-D is designed to intelligently create a comfortable and healthy indoor air climate, while remaining invisible. This allows user to enjoy conditioned air without sacrificing room space or interior design creativity.

Flexibility In System Design
The unit offers fan motor that can operate up to 4 speeds, thus provide choices of external static pressure for designing ducting system.

Easy Serviceability
With the concept of easy serviceability in mind, MCC-D series is designed for easy access to internal components. The internal components, such as fan motor or blower, can be easily accessed for servicing through both sides or bottom of the unit.

High Level Of Protection
The unit is incorporated with a unique safety feature, i.e. a float switch, to provide an additional protection from possible problems of condensate water over flow inside the unit. Once the condensate water reaches critical level, the level switch will be activated and signal will be sent to the microprocessor controller to stop the compressor as well as sending an error message to the wired controller, alerting the user, for further action.

Wired Remote Controller
The standard unit comes with the Netware III controller, which offers wide range of control features that, includes 7 days and 24 hours timer setting and more. The MCC-D series is able to communicate with the versatile NIM network control module and offers the opportunity of one centralized control for a system of multiple indoor units in a building.

Auto Random Restart
Auto random restart function allows the unit to automatic restart as the last setting condition when the power supply is resumed after power failure. However, the compressor will restart randomly if more than one unit is installed and sharing the same phase of power.

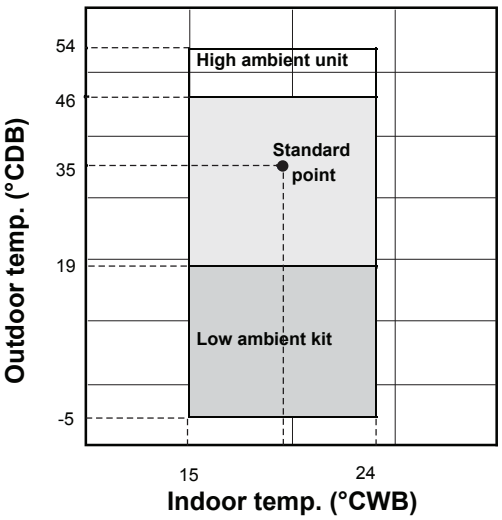
Self Diagnosis
The microprocessor provides the possibility to detect and diagnose any fault or malfunction that occurs in the system. The error will be reflected by the wired remote controller with a series of error code.

Application Information

Operating Range

Ensure the operating temperature is in allowable range.

Cooling only

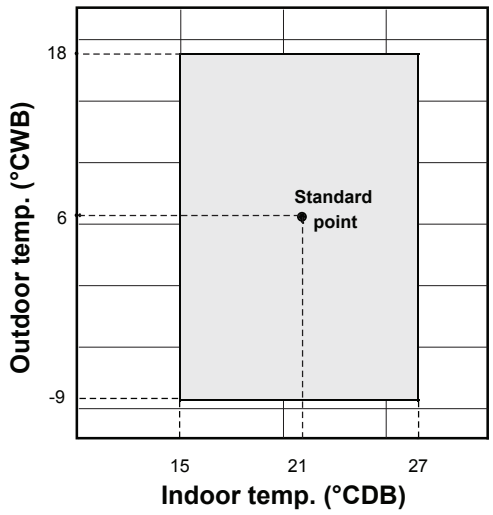


Caution :

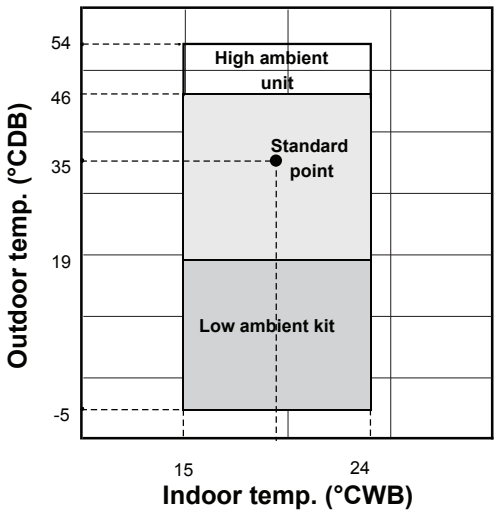
The use of your air conditioner outside the range of working temperature and humidity can result in serious failure.

Heat pump

Heating



Cooling



Note :

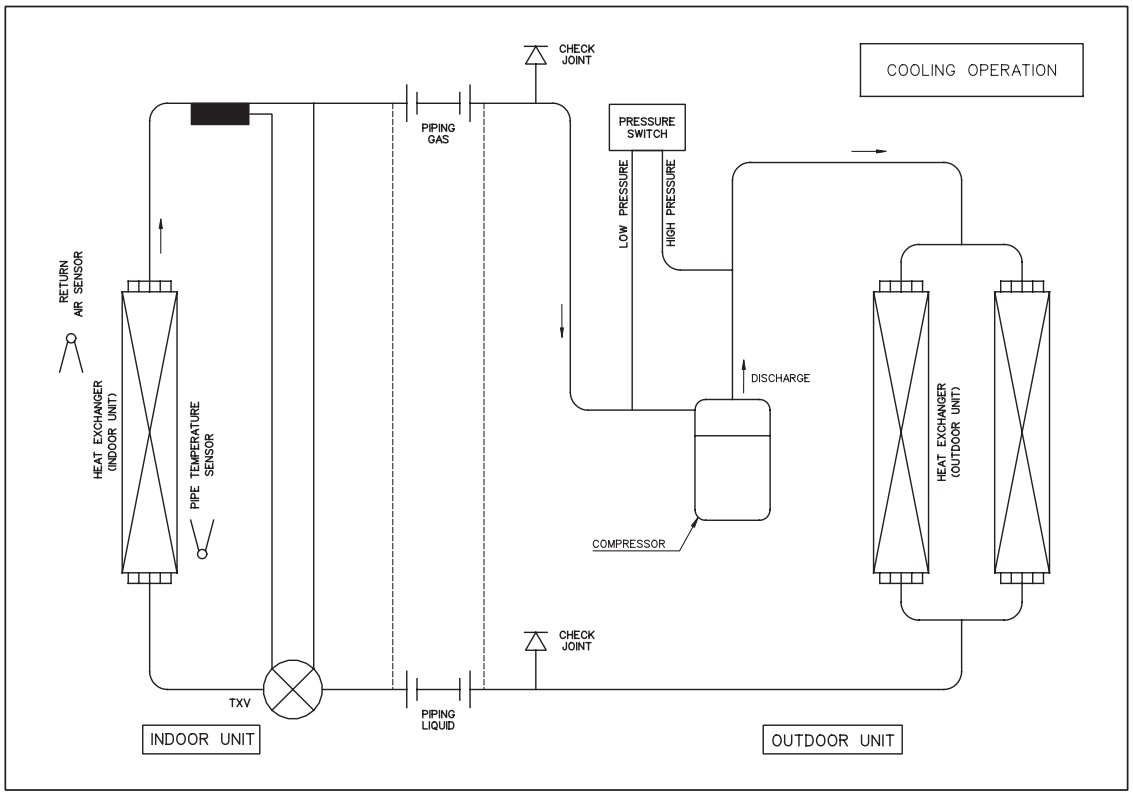
Standard operating range.

With High ambient unit. (Optional item)
Please refer to local dealer for unit of this specification.

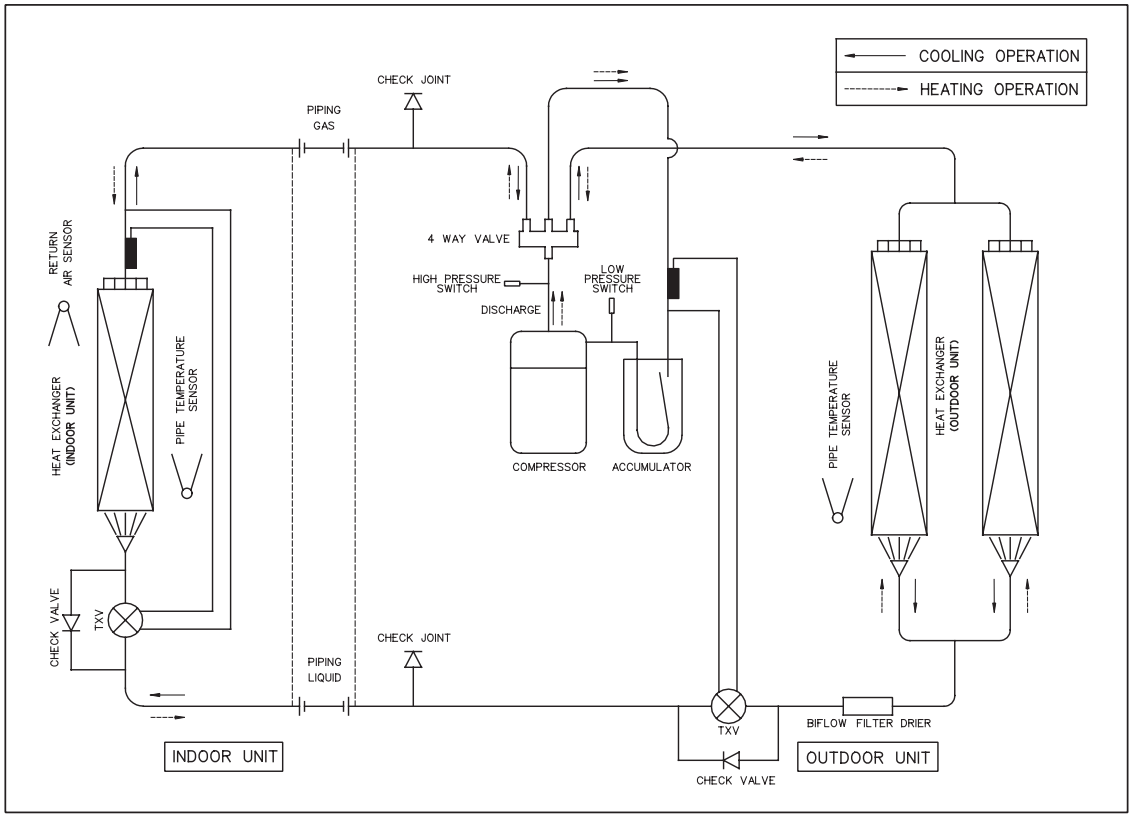
With Low ambient kit. (Optional item)
Please refer to local dealer for unit of this specification.

Refrigerant Circuit Diagrams

Model: MCC 075D – MMC 075D MCC 100D – MMC 100D
MCC 075D – M4MC 075D MCC 100D – M4MC 100D



Model: MCC 075DR – MMC 075ER MCC 100DR – MMC 100ER
MCC 075DR – M4MC 075ER MCC 100DR – M4MC 100ER



Controllers

Netware III

Fan Speed Display
Displays the fan speed setting.
(Auto/High/Medium/Low)

Operation Mode Display
Displays the current mode of operation.

Sleep Display
Display the sleep / energy saving status.

Error Display

Swing Display
Display the air swing status.

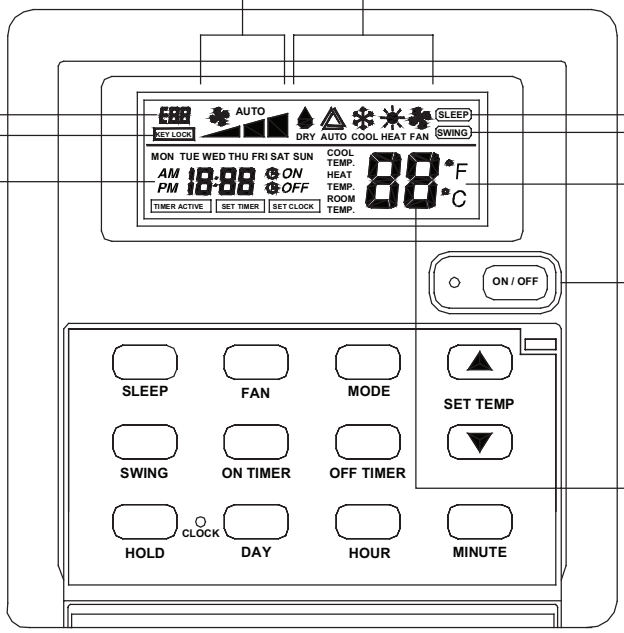
Key Lock Display
Display indicates when key lock function is activated.

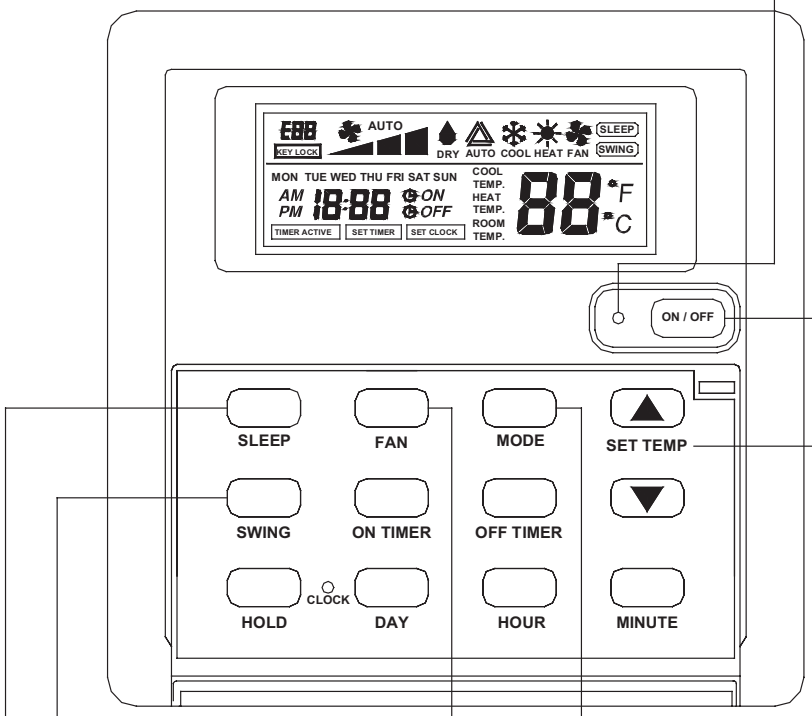
°C or °F Display
Display the temperature in °C or °F.

On/Off Status Lamp Display

Current Time, Start / Stop Time Display
Display the current time as well as the start and stop time programmed.

Set Temperature or Room Temperature Display
Display the set or room temperature.





Operating Lamp

On / Off

- *Starting operation:* When the unit is off, press the ON/OFF button. The operation LED lights and the unit will be turned on.
- *Stopping operation:* When the unit is on, press the ON/OFF button. The operation LED is extinguished and controls are turned off.

Set Temperature

- Press this button to set the temperature. By pressing up or down once, temperature changes by 1°C (or 1°F).
- The temperature range is 16°C to 30°F (60°F to 85°F).
- In FAN mode, temperature cannot be set.
- Pressing up and down buttons simultaneously will toggle the temperature unit between °C and °F.
- When set temperature button is pressed, the set temperature will be displayed for 5 seconds. After that, room temperature will be displayed.

Swing
Press SWING button to activate the air sweep function.

Sleep
Press SLEEP button to activate the sleep or energy saving mode.

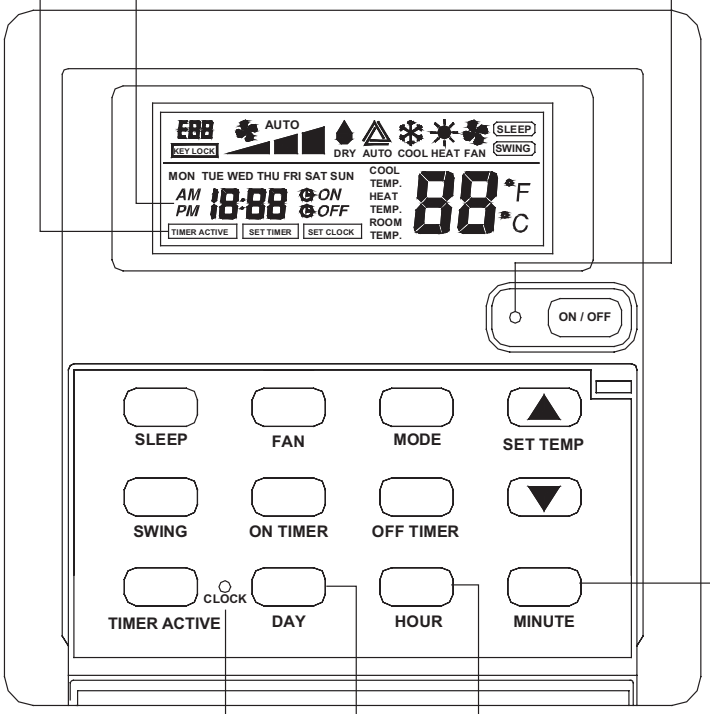
Fan
Press FAN button to select Auto, High, Medium or Low fan speed.

Mode
Press MODE button to select operation mode from Cool, Heat, Auto, Dry and Fan. The display will show the selected mode.

Timer Active Display

Current Time Display

Operating Lamp



Key Lock

- This feature protects the controls from being tempered with by children or unauthorized persons.
- To activate, press MINUTE button three times consecutively, “KEY LOCK” symbol will appear on the LCD display.
- During this time, ON/OFF button and FAN button can be used.
- To cancel this feature, press the MINUTE button again three times consecutively.

Minute

When the control is in set clock or set timer mode, pressing the MINUTE button will change the set minute.

Hour

When the control is in set clock or set timer mode, pressing the HOUR button will change the set hour.

Day

When the control is in set clock or set timer mode, pressing the DAY button will change the set hour.

Clock

- Press button once to set the clock mode.
- Press button again to disable the clock mode.
- When the clock mode is activated, the time and date can be set or changed by pressing ther DAY, HOUR & MINUTE button.

Timer Active

- Press button until “TIMER ACTIVE” appears to activate the timer.
- The symbol will indicate Event 1, Event 2 and/or Event 3 timers are active.
- To clear the timer setting, press and hold TIMER ACTIVE button for 2 to 3 second until the word “TIMER ACTIVE” is no longer display.

–To resume the timer setting after the timer has been deactivated, press and hold TIMER ACTIVE button again for 2 to 3 seconds until the word “TIMER ACTIVE” is displayed.

Operating State and Fault Table

Wired Handset – Netware III
Cooling / Heat Pump Model

Event	Error Code
Room sensor open or short	Blink E1
Indoor coil sensor open	Blink E2
Outdoor coil sensor open	Blink E3
Compressor overload / Indoor or outdoor coil sensor short	Blink E4

Phase Sequencer
The unit with Scroll Compressor can only rotate in one direction. For this reason, a protective device (phase sequencer) is fitted to prevent incorrect wiring of the electrical phases. When the three phases are not connected correctly, the phase sequencer operates, and the unit will not start. This devise is located in the control box of the outdoor unit.

The following table shows the LED indicator light for phase sequencer under normal operation and fault conditions.

	LED-P (Red)	LED-R (Yellow)	LED-S (Yellow)	LED-T (Yellow)
Normal Operation	On	-	-	-
Reverse Phase	Blink	Blink	Blink	Blink
S & T Phase Missing	Blink	-	Blink	Blink
T Phase Missing	Blink	-	-	Blink
S Phase Missing	Blink	-	Blink	-
R Phase Missing	-	-	-	-
Overload	Blink	-	-	-
Sensor Missing	Blink	On	On	On

Notes: 1. "-" means LED off.
2. When R phase missing, no LED or buzzer will indicate the error, but relay 71 (Common) and 81 (NO) will cut off.
3. The unit will check the discharge sensor availability only during power up.
4. All errors can only recover through **manually reset.**

Installation

Caution

Sharp edges and coil surfaces are potential injury hazard. Avoid from contact with them.

(1) Installation of Indoor Unit

Preliminary Site Survey

- Electrical supply and installation is to confirm to local authority's (e.g. National Electrical Board) codes and regulations.
- Voltage supply fluctuation must not exceed ± 10% of rated voltage. Electricity supply lines must be independent of welding transformers which can cause high supply fluctuation.
- Ensure that the location is convenient for wiring, piping and drainage.

Standard Mounting

Ensure that the overhead supports are strong enough to hold the weight of the unit. Position the hanger rods and check for its alignment with the unit. Also, check that the hangers are secured and the base of the fan coil unit is leveled in both horizontal directions, taking into account the gradient for drainage flow as recommended in Figure A.

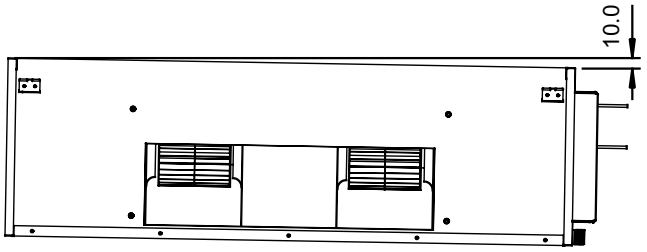


Figure A

The indoor unit must be installed such that there is no short circuit of the cool discharge. Comply with the installation clearance recommended as shown in Figure B. Do not put the indoor unit where there is direct sunlight on the unit. Make sure the location is suitable for piping and drainage.

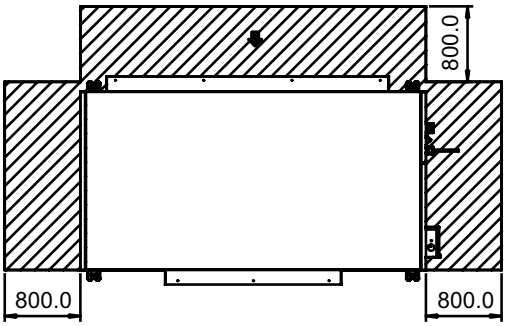


Figure B

Pipings

Do not use contaminated or damaged copper tubings. If pipings, evaporator or condenser is exposed or had been opened for 15 seconds or more, vacuum and purge with field supplied refrigerant. Generally, do not remove plastic, rubber plugs or caps from fittings, tubings and coils until ready to connect suction or liquid line into fittings.

For MCC 075/100D/DR, the piping connections are brazing type. If any brazing work is required, ensure that nitrogen gas is passed through coil and joints while brazing work is being done. This will eliminate soot formation on the inside walls of copper tubings.

Electrical Connection

As wiring regulations differ from each country, please drefer to your LOCAL ELECTRICAL CODES for field wiring regulations and ensure that they are complied with. Besides, take note of the following general precautions:

1. Ensure that the rated voltage of the unit correspond to the name plate before commencing wiring work.
2. Provide a power outlet to be used exclusively for each unit and a power supply disconnect and a circuit breaker for over-current protection should be provided in the exclusive line.
3. The unit must be EARTHED to prevent possible hazards due to insulation failure.
4. All wiring must be firmly connected.
5. Electrical wiring must not touch the refrigerant piping, compressor and any moving parts of the fan motor.

Operational Check

After all wiring is completed and system is charged with refrigerant, make sure unit is operating properly. Check that:

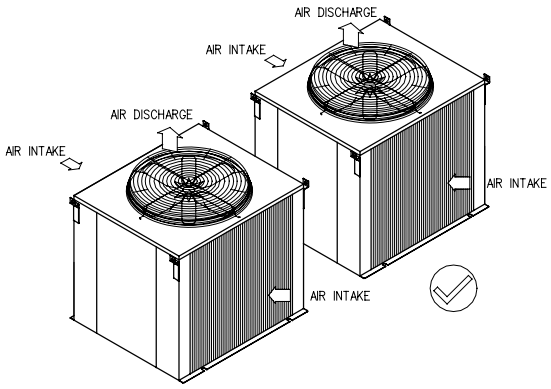
1. Condenser fans are running with warm air blowing off the condenser coil.
2. Evaporator fans are running and discharging cool air.
3. Suction line pressures and condensing pressures are in the range of 60 – 75 psig. and 260 – 300 psig. respectively in cooling cycle or 45 – 60 psig. and 245 – 285 psig. respectively in heating cycle.
4. Microprocessor electronic thermostats as used in the remote controls incorporate a 3 minutes delay in their circuit. Thus it requires about 3 minutes upon start-up before the outdoor unit is activated.

(2) Installation of Outdoor Unit

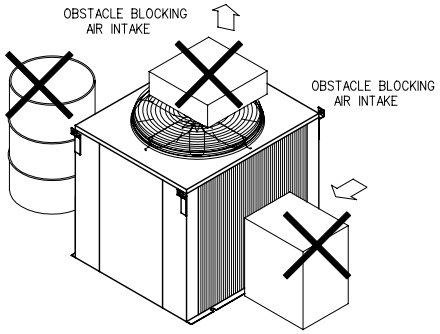
MMC Series

As condensing temperature rises, evaporating temperature rises and cooling capacity drops. In order to achieve maximum cooling capacity, the location selected for outdoor unit should fulfill the following requirements:

- Install the condensing (outdoor) unit in a way such that hot air distributed by the outdoor condensing unit cannot be drawn in again (as in the case of short circuit of hot discharge air). Allow sufficient space for maintenance around the unit



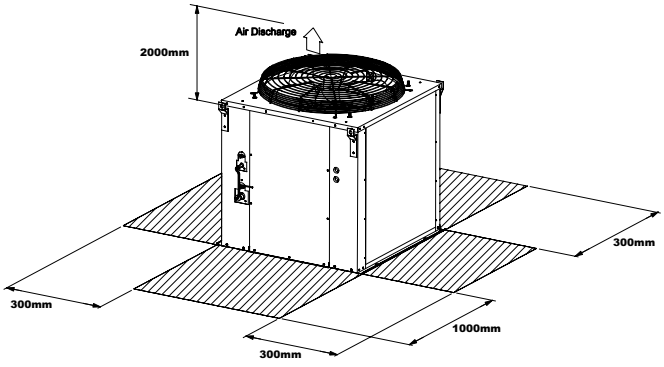
- Ensure that there is no obstruction of air flow into or out of the unit. Remove obstacles which block air intake or discharge.



- The location must be well ventilated, so that the unit can draw and distribute plenty of air thus lowering the condensing temperature.
- A place capable of bearing the weight of the outdoor unit and isolating noise and vibration.
- A place protected from direct sunlight. Otherwise use an awning for protection, if necessary.
- A place where the hot air discharge and operating sound level will not annoy the neighbours.
- The location must not be susceptible to dust or oil mist.

Installation Clearance

- Outdoor units must be installed such that there is no short circuit of the hot discharge air or obstruction to smooth air flow.



CAUTION : If the condensing unit is operated in an atmosphere containing oils (including machine oils), salt (coastal area), sulphide gas (near hot spring, oil refinery plant), such substances may lead to failure of the unit.

(3) Refrigerant Piping

Field Piping
To ensure satisfactory operation and performance, the following points should be noted for the field piping arrangements of the complete refrigerant cycle.

a) Liquid loops or oil traps must be provided according to the position of the outdoor and indoor units (depending on whether the indoor unit is above or below the outdoor unit).
b) Field supplied filter dryer should be provided as close to the expansion valve(s) of the indoor unit (evaporator) as possible.
c) Field supplied sight glass must be assembled and mounted next to filter dryer.

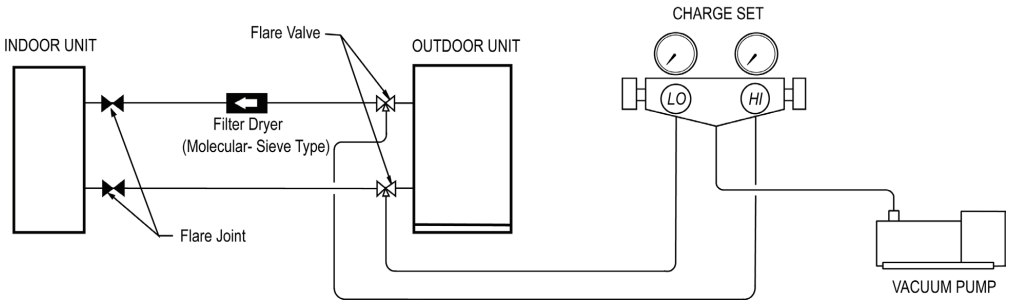
Maximum Piping Length and Maximum Number of Bends
When the pipe length becomes too long, both the capacity and reliability drop. As the number of bends increases, system piping resistance to the refrigerant flow increases, thus lowering the cooling capacity, and as the result the compressor may become defective. Always choose the shortest path and follow the recommendation as tabulated below:

Model	Indoor	MCC 075/100 D/DR
	Outdoor	MMC/M4MC 075/100 D/DE
Maximum Length, m		35
Maximum Elevation, m		20
Maximum No. of Bends		8

CAUTION:
1) Our guarantee on the performance of our air-conditioners is strictly revoked if the height, length and/or the number of bends of the refrigerant piping system installed is beyond the limit above.
2) Bendings must be carefully made so as not to crush the pipe. Use a pipe bender to bend a pipe as far possible.

(4) Vacuuming and Charging

The pre-charged outdoor unit does not need any vacuuming or charging. However once it is connected, the connecting pipe line and the indoor unit need to be vacuumed before releasing the R22/R407C from the outdoor unit.
1. Open the service port core cap.
2. Connect pressure gauge to the service port.
3. Connect the line to vacuum pump. Open the charging manifold valve and turn the pump on. Vacuum to -0.1 MPa (-760mmHg) or lower. (Evacuation time varies by the pump but averagely in 1 hour).



CAUTION FOR R407C
Do not top-up when servicing leak, as this will reduce the unit performance. Vacuum the unit thoroughly and then charge the unit with fresh R407C according to the amount recommended in the specification.

Guidelines Of Field-charging Air Conditioning Systems With Scroll Compressors

These guidelines are intended for use with Scroll compressors only with R22, R407C, R134a, R404A, R507, and R410A refrigerants. They do not apply to reciprocating compressors or competitive Scroll compressors.

Field-charging - Some Precaution Points

Scroll compressors have a very high volumetric efficiency and quickly pump a deep vacuum if there is insufficient refrigerant in the system or if refrigerant is added too slowly. Operation with low suction pressure will quickly lead to very high discharge temperatures. While this process is happening, the scrolls are not being well lubricated - scrolls depend on the oil mist in the refrigerant for lubrication. A lack of lubrication leads to high friction between the scroll flanks and tips and generates additional heat. The combination of heat of compression and heat from increased friction is concentrated in a small localized discharge area where temperatures can quickly rise to more than 300°C. These extreme temperatures damage the Scroll spirals and the orbiting Scroll bearing. This damage can occur in less than one minute especially on larger compressors. Failure may occur in the first few hours or the damage done during field charging may show up some time later.

Other typical field charging problems include undercharging, overcharging, moisture or air in the system etc. In time each one of these problems can cause compressor failure.

Equipment

Minimal equipment is required for field charging. The minimum equipment required to do a satisfactory job is:-

Set of service gauges
Hoses
Vacuum pump
Vacuum gauge
Scales
Thermometer

Charging Hoses

Most field-charging is done using standard service hoses. Hoses are made in different colors with different working pressures and with different leak rates but the most important point is the presence or absence of Shredder valve depressors. Shredder valve depressors severely restrict the flow through the service hoses. This slows evacuation and vapor charging dramatically. In most cases the Shredder depressor can be re¬moved but it is simpler to have one set of hoses with and one set without Shredder depressors.

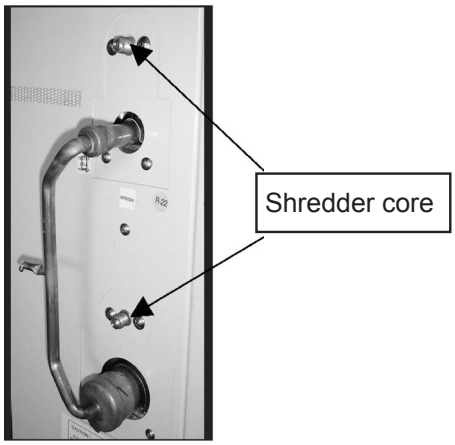
Hose with Shredder valve Depressor

Hose without Shredder valve Depressor

Hose selection is important depending whether the system is being evacuated or charged. Charging liquid from the cylinder into the liquid line should be carried out using an open hose connected to an unrestricted fitting. This will reduce charging time.

Typical service valves

Found on the outdoor unit



Shredder valves

Shredder valve
with core in place

Shredder valve with core removed

Most split systems have a suitable connection on the outdoor unit

Shredder valves provide easy system access for pressure reading and addition of refrigerant. On small systems, they provide a reasonable connection for evacuation also. However, Shredder valves and the hoses connected to them can cause very severe pressure drops and can multiply evacuation time by a factor of 4 or 5.

On the positive side, Shredder valves provide a restriction that slows the speed of liquid charging into the suction side. When a pressure drop is desirable (charging liquid into suction), connect via a Shredder valve. When a pressure drop is detrimental (evacuation), connect via an open fitting.

How Much Refrigerant?

The proper refrigerant charge should follow the volume as recommended by manufacturer and recommendation should be followed by the installer. Refer to the table of Refrigerant Charge Level.

If the installer cannot find the correct charge but the system must be started, refrigerant should be carefully added to the system until reasonable sub-cooling is measured in the liquid line and reasonable suction superheat is measured at the compressor suction. Suction and discharge pressures must be monitored carefully during the charging process.

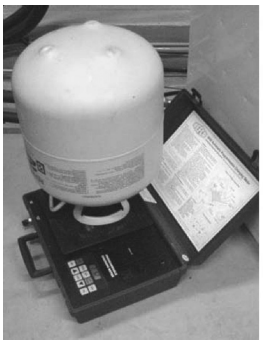
Charge Limits

Copeland Scroll compressors have the different charge limits for different compressor models as shown in table below. If the total charge exceeds these limits, the system should have a crankcase heater and/or pump down cycle and/or accumulator to prevent liquid damage to the compressor. Some systems may require accumulators to limit liquid floodback even though the charge is lower than the published limit.

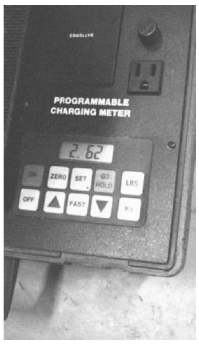
Compressor Range	Model	lbs.	kg.
Quest	**ZR46 to ZR81**	**10**	**4.5**
Summit	**ZR84 to ZR144**	**16**	**7.3**
Specter	**ZR90 to ZR19M**	**17**	**7.7**

Charging Recommendations

Charging liquid in a CONTROLLED manner into the suction side until the system is full. This recommendation does not hold true for reciprocaing compressors where liquid charging into the suction side could cause severe damage.



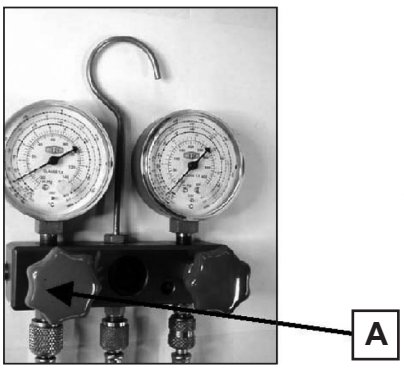
Charging Cylinder on Scale



Close-up of Scale

Carefully monitor the suction and discharge pressures - ensure that the suction pressure does not fall below 25 psig (1.7 bar) at any time during the charging process.

CAUTION : Manifold Gauge will show cylinder pressure rather than suction pressure if the cylinder valve and Manifold valve “A” are both open.



There are many ways of charging liquid in a “controlled manner” into the suction side:-

1. Use valve A on the manifold gauge set
2. Use the valve on the refrigerant cylinder
3. Charge through a Shredder valve
4. Use a hose with a Shredder valve depressor
5. Charge into the suction side at some distance from the compressor
6. All of the above

Charging Procedures -Three phase compressors

The fundamental procedure is the same as for single phase models but the compressor can run in the wrong direction on starting. If this happens reverse any two phases and start again. Short term reverse rotation will not damage the compressor.

As compressors get larger the importance of correct field charging procedures grows exponentially. Unfortu¬nately larger systems are often field charged which leads to many infant failures. All Specter compressors have internal discharge temperature protectors which are very effective in preventing dangerously high discharge temperatures during charging. The protection module will trip and lock the compressor out for 30 minutes. It is not normally necessary to wait 30 minutes for the module to reset. When the compressor has cooled down the module can be reset by breaking the power supply to the control circuit. Very often the serviceman does not understand why the module tripped and uses a jumper wire to bypass it. He continues to charge the system and removes the jumper when charging is complete. The compressor may or may not run with the protector back in the circuit but it is certain that the compressor has been damaged and premature failure is inevitable.

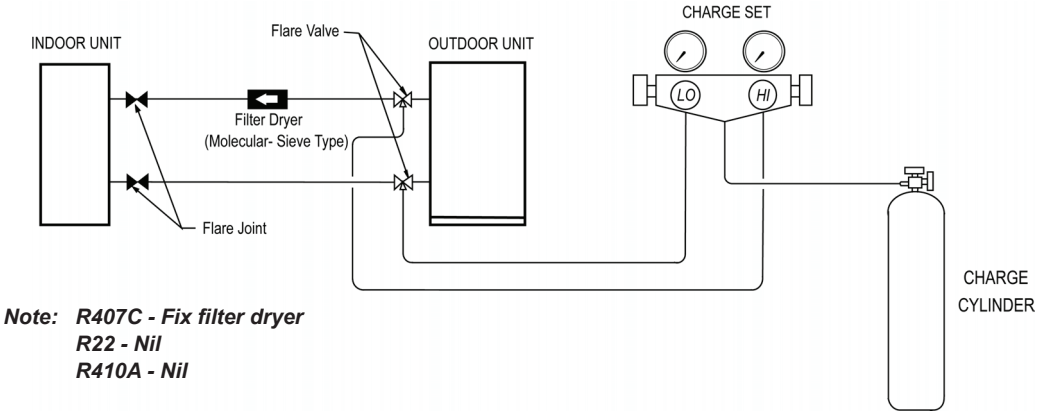
(5) Additional Charge

- The refrigerant charge has already charged into the outdoor unit. For the piping length of 7.6m, additional refrigerant charge after vacuuming is not necessary.
- For MMC 075/100D/ER, please refer to the table below:

Liquid Pipe Size, inch	Additional Charge, kg/meter
1/2”	0.10
5/8”	0.17

The additional refrigerant charge amount recommended is a guideline for longer piping application. The actual charge required may be different from the guideline due to different application and variation in site conditions.

Diagram shows typical charging method:



Note: ***R407C - Fix filter dryer***
R22 - Nil
R410A - Nil

CAUTION FOR R407C
Avoid prolong exposure of an opened compressor, or the internal part of refrigerant piping to moist air. The POE oil in the compressor and piping can absorb moisture from air.

Special Precaution When Dealing With Refrigerant R407C Unit

(1) What is new refrigerant R407C?

R407C is a zeotropic refrigerant mixture which has Zero Ozone Depletion Potential (ODP = 0) and thus, conforms to the Montreal Protocol regulation. It requires Polyol-ester (POE) oil for its compressor's lubricant. Its refrigerant capacity and performance are about the same as the refrigerant R22.

(2) Components

Mixture of composition by weight: R32(23%), R125(25%), R134a(52%)

(3) Characteristic

- R407C liquid and vapor components have different compositions when the fluid evaporates or condenses. Hence, when a leak occurs and only vapor leaks out, the composition of the refrigerant mixture left in the system will change and subsequently affect the system performance. DO NOT add new refrigerant to a leaked system. It is recommended that the system should be evacuated thoroughly before recharging with R407C.
- When refrigerant R407C is used, the composition will differ depending on whether it is in gaseous or liquid phase. Hence when charging R407C, ensure that only liquid is being withdrawn from the cylinder or can. This is to make certain that only original composition of R407C is being charged into the system.
- POE oil is used as a lubricant for R407C compressor, which is different from the mineral oil used for R22 compressor. Extra precaution must be taken to avoid exposing the R407C system to moist air.

(4) Check list before installation / servicing

- Tubing
  Refrigerant R407C is more easily affected by dust of moisture compared with R22, make sure to temporarily cover the ends of the tubing prior to installation.
- Compressor oil
  No additional charge of compressor oil is permitted.
- Refrigerant
  No other refrigerant other that R407C
- Tools
  Tools specifically for R407C only (must not be used for R22 or other refrigerant)
  i) Gauge manifold and charging hose
  ii) Gas leak detector
  iii) Refrigerant cylinder / charging cylinder
  iv) Vacuum pump c/w adapter
  v) Flare tools
  vi) Refrigerant recovery machine

(5) Handling and installation Guidelines

Like R22 systems, the handling and installation of R407C systems are closely similar. All precautionary measures; such as ensuring no moisture, not dirt or chips in the system, clean brazing using nitrogen, and through leak check and vacuuming are equally important requirements. However, due to the zeotropic nature of R407C and its hydroscopic POE oil, additional precautions must be taken to ensure optimum and trouble-free system operation.

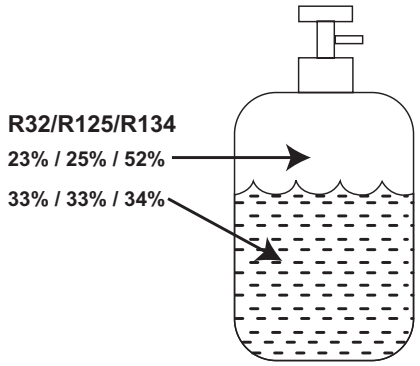
(a) Filte4r-dryer must be installed along the liquid line for all R407C air conditioners. This is to minimize the contamination of moisture and dirt in the refrigerant system. Filter-dryer must be of molecular sieve type. For a heat-pump system, install a two-way flow filter dryer along the liquid line.

(b) During installation or servicing, avoid prolong exposure of the internal part of the refrigerant system to moist air. Residual POE oil in the piping and components can absorb moisture from the air.

(c) Ensure that the compressor is not exposed to open air for more than the recommended time specified by its manufacturer (typically less than 10 minutes). Remove the seal-plug only when the compressor is about to be brazed.

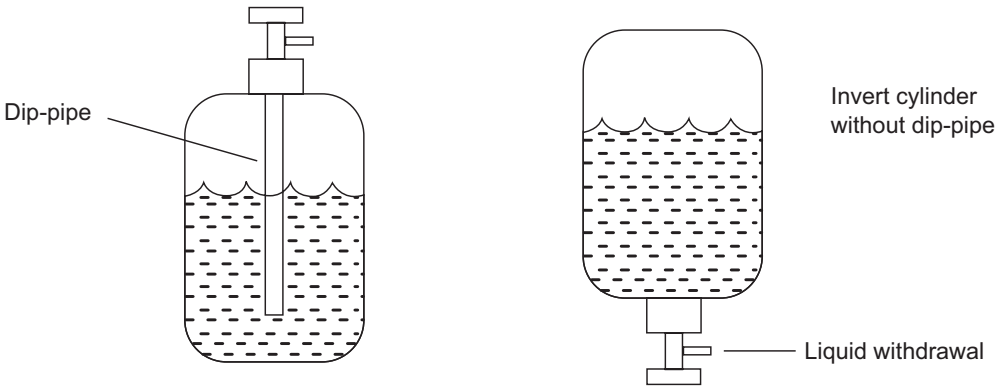
(d) The system should be thoroughly vacuumed to 1.0 Pa (-700mmHg) or lower. This vacuuming level is more stringent then R22 system so as to ensure no incompressible gas and moisture in the system.

(e) When charging R407C, ensure that only liquid is being withdrawn from the cylinder or can. This is to ensure that only the original composition of R407C is being delivered into the system. The liquid composition can be different from the vapour composition.



Composition of R407C in vapour phase is different from liquid phase.

(f) Normally, the R407C cylinder or can is being equipped with a dip-pipe for liquid withdrawal. However, if the dip-pipe is not available, invert the cylinder or can so as to withdraw liquid from the valve at the bottom.



(g) When servicing leaks, the top-up method, commonly practiced for R22 system, is not recommended for R407C systems. Unlike R22 where the refrigerant is of a single component the composition of R407C (which is made-up of three different components) may have changed during the leak. Consequently, a top-up may not ensure that the R407C in the system is of the original composition. This composition shift may adversely affect the system performance. It is recommended that the system by evacuated thoroughly before recharging with R407C.

(6) Overall Checking

- Ensure the following, in particular:
  1. The unit is mounted solidly and rigid in position.
  2. Piping and connections are leak proof after charging.
  3. Proper wiring has been done.
- Drainage check – pour some water into drain pan.
- Test run
  1. Conduct a test run after water drainage test and gas leakage test.
  2. Watch out for the following:
     (a) Is the electric plug firmly inserted into the socket?
     (b) Is there any abnormal sound from the unit?
     (c) Is there any abnormal vibration with regard to the unit itself or piping?
     (d) Is there smooth drainage of water?
- Check that:
  1. Outdoor fan is running, with warm air blowing off the outdoor unit (cooling cycle).
  2. Indoor blower is running and discharge cool air (cooling cycle).
  3. Suction (low side) pressure is as per recommendations.
  4. The remote controller has incorporated a 3 minutes delay in the circuit. Thus, it requires about 3 minutes before the outdoor unit can start up.

(7) Standard Operating Condition

Cooling Only Unit

Temperature	Ts ˚C / ˚F	Th ˚C / ˚F
Minimum Indoor Temperature	19.4 / 66.9	13.9 / 57.0
Maximum Indoor Temperature	26.7 / 80.1	19.4 / 66.9
Minimum Outdoor Temperature	19.4 / 66.9	13.9 / 57.0
Maximum Outdoor Temperature	46 / 114.8	24 / 75.2

Heat Pump Unit

Temperature	Ts ˚C / ˚F	Th ˚C / ˚F
Minimum Indoor Temperature	10 / 50	-
Maximum Indoor Temperature	26.7 / 80.1	-
Minimum Outdoor Temperature	-8 / 17.6	-9 / 15.8
Maximum Outdoor Temperature	24 / 75.2	18 / 64.4

Sound Data

Sound Power

MCC 075D/DR									
Ext. Static (mmAq)	Speed	1/1 Octave Sound Power Level (dB, reference 1pW)							Overall (dBA)
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
20	SH	69	71	72	73	71	69	65	78
14	Hi	67	69	72	72	70	68	64	77
10	Me	62	66	69	69	65	63	58	73
7	Lo	58	61	64	64	61	58	51	68

MCC 100D/DR									
Ext. Static (mmAq)	Speed	1/1 Octave Sound Power Level (dB, reference 1pW)							Overall (dBA)
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
20	SH	75	72	74	75	73	72	67	80
14	Hi	75	71	73	74	72	70	66	79
10	Me	76	69	71	72	69	68	63	76
7	Lo	75	65	68	67	65	62	57	72

Duct Discharge Sound Power Level: Test with 5ft length discharge duct, terminated flush with internal wall of reverberation room.

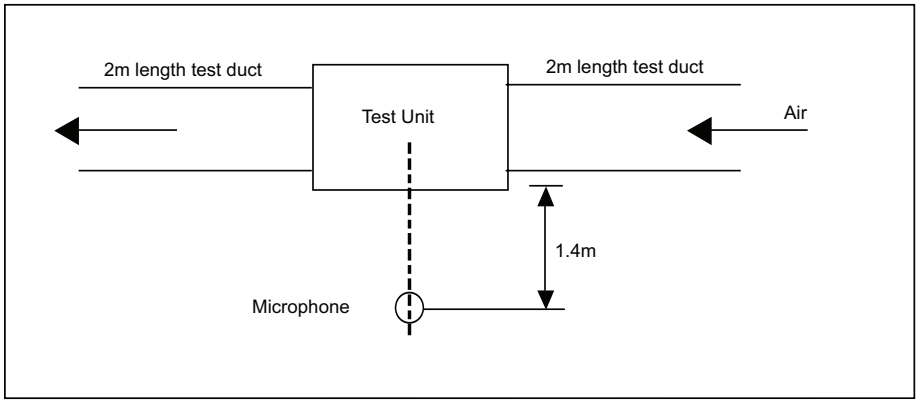
Sound Pressure

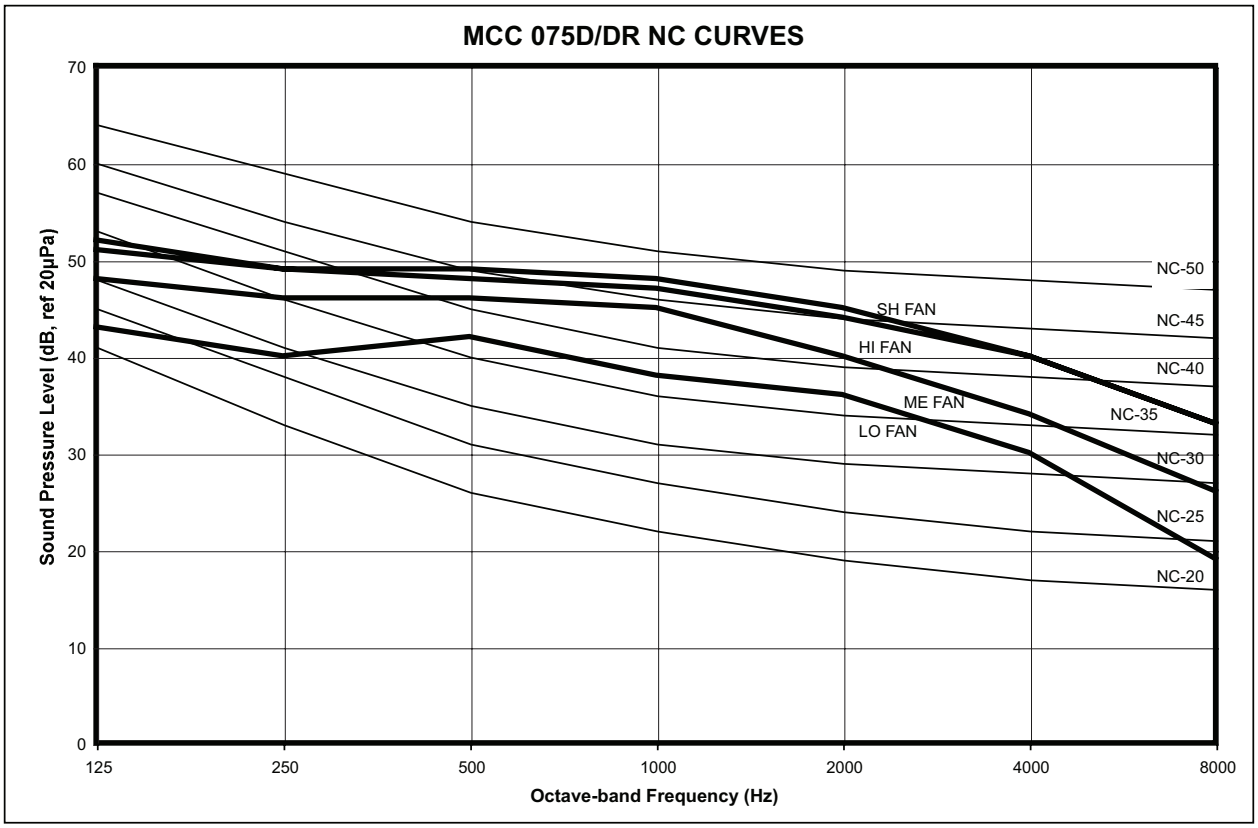
MCC 075D/DR										
Ext. Static (mmAq)	Speed	1/1 Octave Sound Pressure Level (dB, reference 20μPa)							Overall	Noise
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	(dBA)	Criteria
20	SH	52	49	49	48	45	40	33	52	47
14	Hi	51	49	48	47	44	40	33	52	46
10	Me	48	46	46	45	40	34	26	48	44
7	Lo	43	40	42	38	36	30	19	43	37

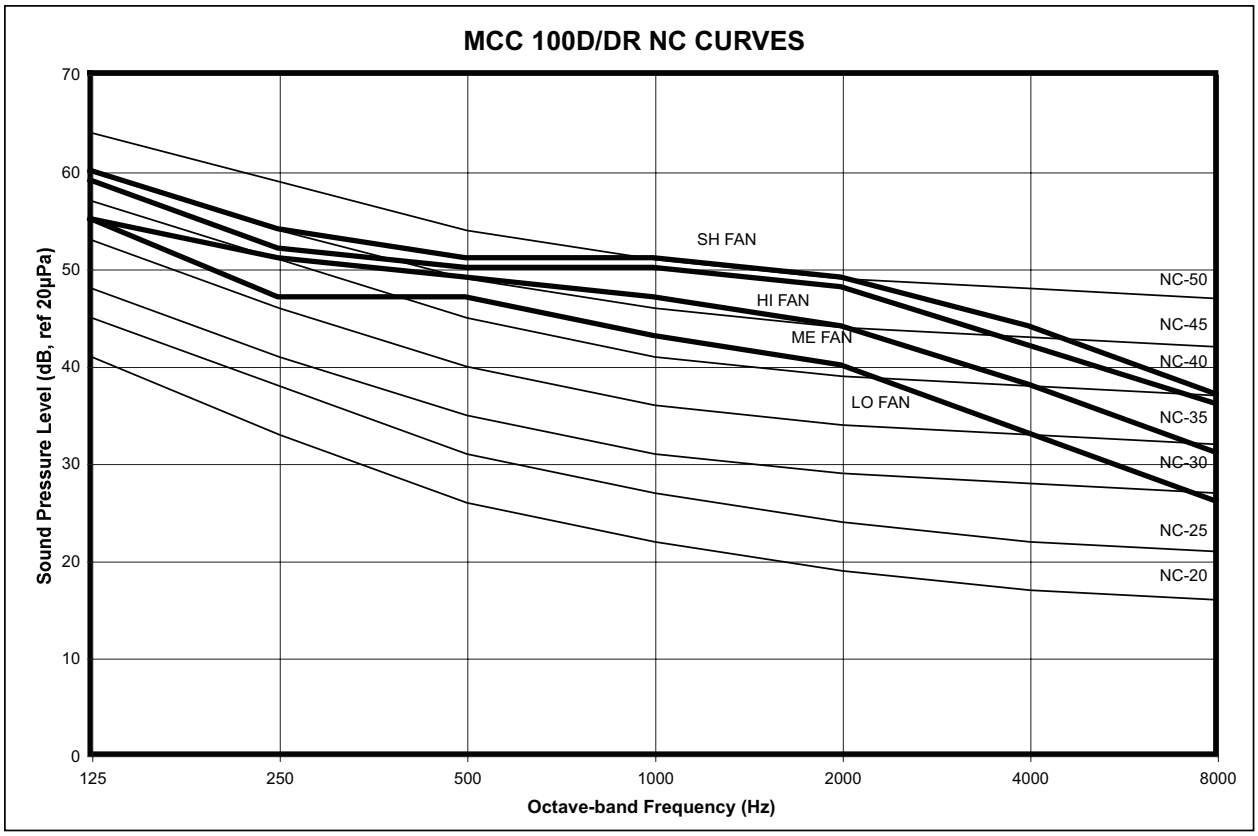
MCC 100D/DR										
Ext. Static (mmAq)	Speed	1/1 Octave Sound Pressure Level (dB, reference 20μPa)							Overall	Noise
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	(dBA)	Criteria
20	SH	60	54	51	51	49	44	37	55	50
14	Hi	59	52	50	50	48	42	36	54	49
10	Me	55	51	49	47	44	38	31	52	46
7	Lo	55	47	47	43	40	33	26	48	43

Microphone position: 1.4m below the centre of the unit. (GB Standard - GB/D17758)
Tested with 2m length duct at the air discharge outlet and air return inlet.

Measuring Location:

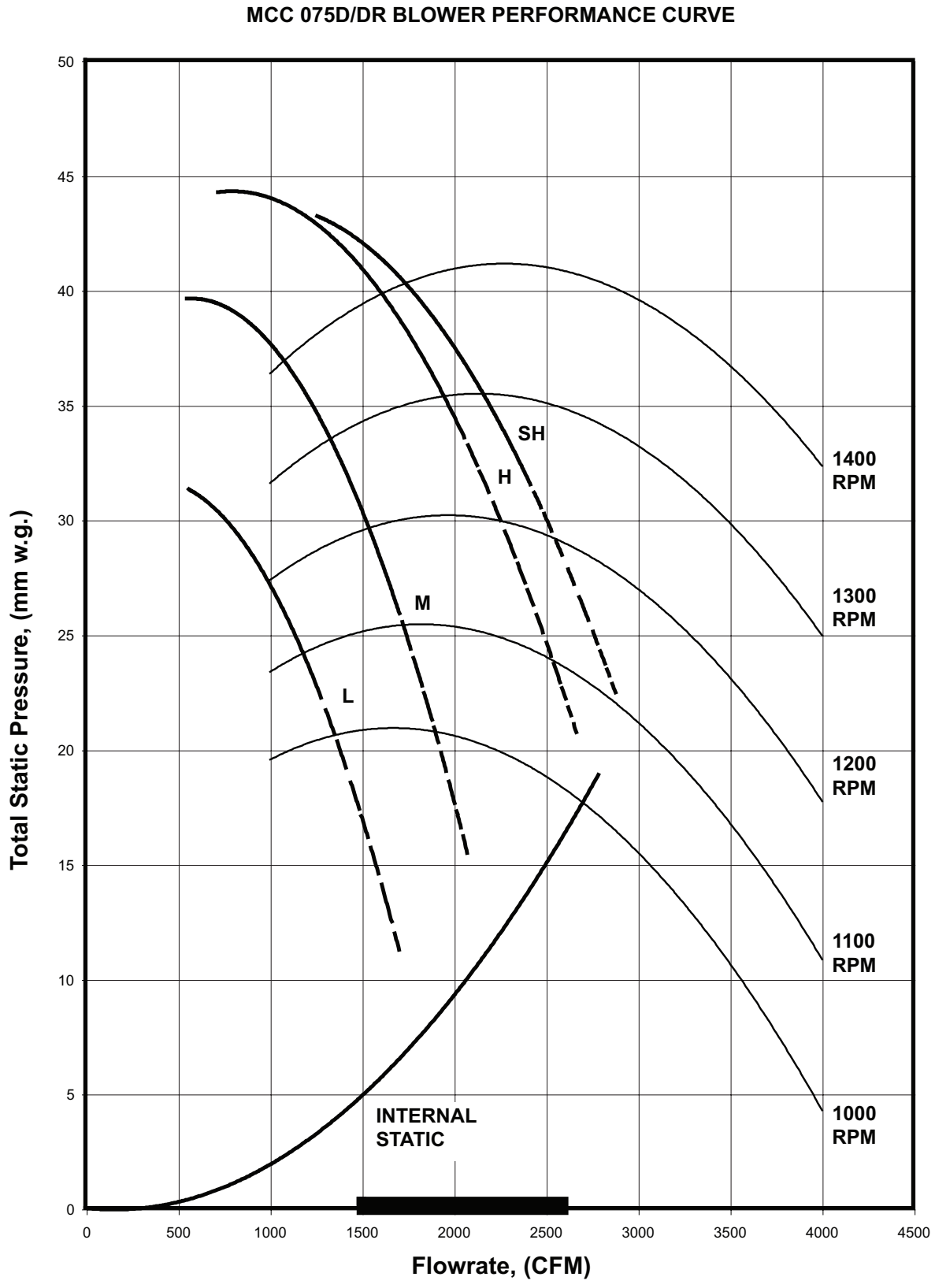



MCC 075D/DR NC CURVES
Sound Pressure Level (dB, ref 20µPa)
70
60
50
40
30
20
10
0
125
250
500
1000
2000
4000
8000
Octave-band Frequency (Hz)
NC-50
NC-45
NC-40
NC-35
NC-30
NC-25
NC-20
SH FAN
HI FAN
ME FAN
LO FAN

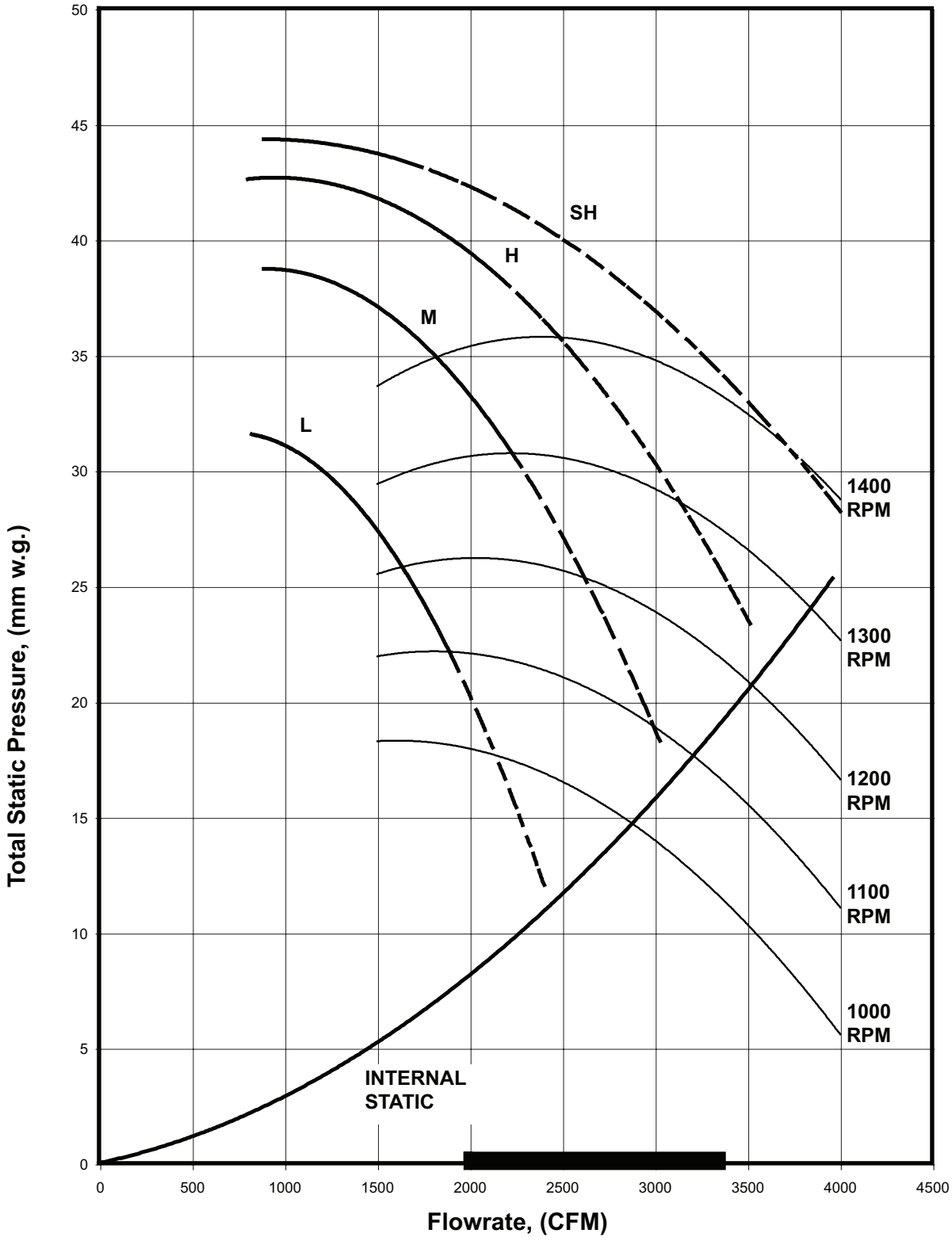

MCC 100D/DR NC CURVES
Sound Pressure Level (dB, ref 20µPa)
70
60
50
40
30
20
10
0
125
250
500
1000
2000
4000
8000
Octave-band Frequency (Hz)
NC-50
NC-45
NC-40
NC-35
NC-30
NC-25
NC-20
SH FAN
HI FAN
ME FAN
LO FAN

Selection Process

Fan Performance Chart



MCC 100D/DR BLOWER PERFORMANCE CURVE



Engineering & Physical Data

Specifications

General Data - Cooling Only (R22)

MODEL		INDOOR UNIT			MCC 075D	MCC 100D
		OUTDOOR UNIT			MMC 075D	MMC 100D
NOMINAL CAPACITY				Btu/h	75000	95000
				W	21960	27820
NOMINAL TOTAL INPUT POWER				W	8471	10822
NOMINAL RUNNING CURRENT				A	16.30	19.40
POWER SOURCE				V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
EER				W/W	2.71	3.01
REFRIGERANT TYPE					R22	
REFRIGERANT CONTROL (EXPANSION DEVICE)					INDOOR TXV	
INDOOR UNIT	CONTROL	AIR DISCHARGE			DUCTED	
		OPERATION			SLM WIRED HANDSET	
	AIR FLOW	SUPER HIGH		l/s / CFM	1142 / 2420	1487 / 3150
		HIGH		l/s / CFM	1156 / 2450	1477 / 3130
		MEDIUM		l/s / CFM	944 / 2000	1340 / 2840
		LOW		l/s / CFM	793 / 1680	1057 / 2240
	EXTERNAL STATIC PRESSURE (SH/H/M/L)			Pa (in.wg.)	196 / 137 / 98 / 69 (0.79 / 0.55 / 0.39 / 0.28)	
	SOUND PRESSURE LEVEL (H/M/L)			dBA	52 / 52 / 48 / 43	55 / 54 / 52 / 48
	UNIT DIMENSION	HEIGHT		mm/in	430 / 16.9	430 / 16.9
		WIDTH		mm/in	1426 / 56.1	1655 / 65.2
		DEPTH		mm/in	826 / 32.5	826 / 32.5
	PACKING DIMENSION	HEIGHT		mm/in	612 / 24.1	612 / 24.1
		WIDTH		mm/in	1535 / 60.4	1765 / 69.5
		DEPTH		mm/in	974 / 38.3	974 / 38.3
	UNIT WEIGHT			kg/lb	92 / 203	119 / 262
	CONDENSATE DRAIN SIZE			mm/in	25.4 / 1.0	25.4 / 1.0
OUTDOOR UNIT	AIR FLOW			l/s / CFM	3304 / 7000	
	SOUND PRESSURE LEVEL			dBA	64	
	UNIT DIMENSION	HEIGHT		mm/in	1041 / 40.98	
		WIDTH		mm/in	981 / 38.62	
		DEPTH		mm/in	981 / 38.62	
	PACKING DIMENSION	HEIGHT		mm/in	1224 / 48.2	
		WIDTH		mm/in	1175 / 46.3	
		DEPTH		mm/in	1150 / 45.3	
	UNIT WEIGHT			kg/lb	170 / 374	184 / 405
	PIPE CONNECTION	TYPE			BRAZING	
		SIZE	LIQUID	mm/in	12.7 / 1/2	15.9 / 5/8
			GAS	mm/in	25.6 / 1-1/8	25.6 / 1-1/8
REFRIGERANT CHARGE				kg/lb	6.70 / 14.77	10.50 / 23.15

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.
2) ALL UNITS ARE BEING TESTED AND COMPLY TO ARI 210/240-94.
3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
COOLING - 26.7°C DB / 19.4°C WB INDOOR AND 35.0°C DB / 23.9°C WB OUTDOOR
4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.
5) EER/COP CALCULATION IS BASED ON EFFECTIVE POWER INPUT AS PER ISO 5151.

General Data - Heat pump (R22)

MODEL		INDOOR UNIT			MCC 075DR	MCC 100DR
		OUTDOOR UNIT			MMC 075ER	MMC 100ER
NOMINAL COOLING CAPACITY				Btu/h	75000	100000
				W	21960	29310
NOMINAL HEATING CAPACITY				Btu/h	84000	110000
				W	24600	32240
NOMINAL TOTAL INPUT POWER (COOLING)				W	7356	10200
NOMINAL TOTAL INPUT POWER (HEATING)				W	7206	9800
NOMINAL RUNNING CURRENT (COOLING)				A	13.60	17.9
NOMINAL RUNNING CURRENT (HEATING)				A	13.30	17.20
POWER SOURCE				V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
EER				W/W	3.14	3.01
COP				W/W	3.59	3.46
REFRIGERANT TYPE					R22	
REFRIGERANT CONTROL (EXPANSION DEVICE)					INDOOR & OUTDOOR TXV	
INDOOR UNIT	CONTROL	AIR DISCHARGE			DUCTED	
		OPERATION			SLM WIRED HANDSET	
	AIR FLOW	SUPER HIGH		l/s / CFM	1142 / 2420	1487 / 3150
		HIGH		l/s / CFM	1156 / 2450	1477 / 3130
		MEDIUM		l/s / CFM	944 / 2000	1340 / 2840
		LOW		l/s / CFM	793 / 1680	1057 / 2240
	EXTERNAL STATIC PRESSURE (SH/H/M/L)			Pa (in.wg.)	196 / 137 / 98 / 69 (0.79 / 0.55 / 0.39 / 0.28)	
	SOUND PRESSURE LEVEL (SH/H/M/L)			dBA	52 / 52 / 48 / 43	55 / 54 / 52 / 48
	UNIT DIMENSION	HEIGHT		mm/in	430 / 16.9	430 / 16.9
		WIDTH		mm/in	1426 / 56.1	1655 / 65.2
		DEPTH		mm/in	826 / 32.5	826 / 32.5
	PACKING DIMENSION	HEIGHT		mm/in	612 / 24.1	612 / 24.1
		WIDTH		mm/in	1535 / 60.4	1765 / 69.5
		DEPTH		mm/in	974 / 38.3	974 / 38.3
	UNIT WEIGHT			kg/lb	92 / 203	119 / 262
	CONDENSATE DRAIN SIZE			mm/in	25.4 / 1.0	25.4 / 1.0
OUTDOOR UNIT	AIR FLOW			l/s / C FM	3304 / 7000	
	SOUND PRESSURE LEVEL			dBA	64	
	UNIT DIMENSION	HEIGHT		mm/in	1041 / 40.98	
		WIDTH		mm/in	981 / 38.62	
		DEPTH		mm/in	981 / 38.62	
	PACKING DIMENSION	HEIGHT		mm/in	1224 / 48.2	
		WIDTH		mm/in	1175 / 46.3	
		DEPTH		mm/in	1150 / 45.3	
	UNIT WEIGHT			kg/lb	170 / 374	184 / 405
	PIPE CONNECTION	TYPE			BRAZING	
		SIZE	LIQUID	mm/in	12.7 / 1/2	15.9 / 5/8
			GAS	mm/in	25.6 / 1-1/8	25.6 / 1-1/8
REFRIGERANT CHARGE				kg/lb	6.80 / 14.99	7.50 / 16.54

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ARI 210/240-94.
3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
a) COOLING - 26.7°C DB / 19.4°C WB INDOOR AND 35.0°C DB / 23.9°C WB OUTDOOR
b) HEATING - 21.1°C DB INDOOR AND 8.3°C DB / 6.1°C WB OUTDOOR
4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.
5) EER/COP CALCULATION IS BASED ON EFFECTIVE POWER INPUT AS PER ISO 5151.

General Data - Cooling Only (R407C)

MODEL		INDOOR UNIT			MCC 075D	MCC 100D
		OUTDOOR UNIT			M4MC 075D	M4MC 100D
NOMINAL CAPACITY				Btu/h	75000	100000
				W	21960	29310
NOMINAL TOTAL INPUT POWER				W	7706	11040
NOMINAL RUNNING CURRENT				A	13.80	19.00
POWER SOURCE				V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
EER				W/W	3.12	2.80
REFRIGERANT TYPE					R407C	
REFRIGERANT CONTROL (EXPANSION DEVICE)					INDOOR TXV	
INDOOR UNIT	CONTROL	AIR DISCHARGE			DUCTED	
		OPERATION			SLM WIRED HANDSET	
	AIR FLOW	SUPER HIGH		l/s / CFM	1142 / 2420	1487 / 3150
		HIGH		l/s / CFM	1156 / 2450	1477 / 3130
		MEDIUM		l/s / CFM	944 / 2000	1340 / 2840
		LOW		l/s / CFM	793 / 1680	1057 / 2240
	EXTERNAL STATIC PRESSURE (SH/H/M/L)			Pa (in.wg.)	196 / 137 / 98 / 69 (0.79 / 0.55 / 0.39 / 0.28)	
	SOUND PRESSURE LEVEL (H/M/L)			dBA	52 / 52 / 48 / 43	55 / 54 / 52 / 48
	UNIT DIMENSION	HEIGHT		mm/in	430 / 16.9	430 / 16.9
		WIDTH		mm/in	1426 / 56.1	1655 / 65.2
		DEPTH		mm/in	826 / 32.5	826 / 32.5
	PACKING DIMENSION	HEIGHT		mm/in	612 / 24.1	612 / 24.1
		WIDTH		mm/in	1535 / 60.4	1765 / 69.5
		DEPTH		mm/in	974 / 38.3	974 / 38.3
	UNIT WEIGHT			kg/lb	92 / 203	119 / 262
	CONDENSATE DRAIN SIZE			mm/in	25.4 / 1.0	25.4 / 1.0
OUTDOOR UNIT	AIR FLOW			l/s / CFM	3304 / 7000	
	SOUND PRESSURE LEVEL			dBA	64	
	UNIT DIMENSION	HEIGHT		mm/in	1041 / 40.98	
		WIDTH		mm/in	981 / 38.62	
		DEPTH		mm/in	981 / 38.62	
	PACKING DIMENSION	HEIGHT		mm/in	1224 / 48.2	
		WIDTH		mm/in	1175 / 46.3	
		DEPTH		mm/in	1150 / 45.3	
	UNIT WEIGHT			kg/lb	170 / 374	184 / 405
	PIPE CONNECTION	TYPE			BRAZING	
		SIZE	LIQUID	mm/in	12.7 / 1/2	15.9 / 5/8
			GAS	mm/in	25.6 / 1-1/8	25.6 / 1-1/8
REFRIGERANT CHARGE				kg/lb	7.00 / 15.43	7.80 / 17.20

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ARI 210/240-94.
3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
COOLING - 26.7°C DB / 19.4°C WB INDOOR AND 35.0°C DB / 23.9°C WB OUTDOOR
4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.
5) EER/COP CALCULATION IS BASED ON EFFECTIVE POWER INPUT AS PER ISO 5151.

General Data - Heat pump (R407C)

MODEL		INDOOR UNIT			MCC 075DR	MCC 100DR
		OUTDOOR UNIT			M4MC 075ER	M4MC 100ER
NOMINAL COOLING CAPACITY				Btu/h	75000	100000
				W	21960	29310
NOMINAL HEATING CAPACITY				Btu/h	84000	110000
				W	24600	32240
NOMINAL TOTAL INPUT POWER (COOLING)				W	7706	11040
NOMINAL TOTAL INPUT POWER (HEATING)				W	7706	9279
NOMINAL RUNNING CURRENT (COOLING)				A	13.80	19.00
NOMINAL RUNNING CURRENT (HEATING)				A	13.80	19.60
POWER SOURCE				V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
EER				W/W	3.12	2.80
COP				W/W	3.49	3.70
REFRIGERANT TYPE					R407C	
REFRIGERANT CONTROL (EXPANSION DEVICE)					INDOOR & OUTDOOR TXV	
INDOOR UNIT	CONTROL	AIR DISCHARGE			DUCTED	
		OPERATION			SLM WIRED HANDSET	
	AIR FLOW	SUPER HIGH		l/s / CFM	1142 / 2420	1487 / 3150
		HIGH		l/s / CFM	1156 / 2450	1477 / 3130
		MEDIUM		l/s / CFM	944 / 2000	1340 / 2840
		LOW		l/s / CFM	793 / 1680	1057 / 2240
	EXTERNAL STATIC PRESSURE (SH/H/M/L)			Pa (in.wg.)	196 / 137 / 98 / 69 (0.79 / 0.55 / 0.39 / 0.28)	
	SOUND PRESSURE LEVEL (SH/H/M/L)			dBA	52 / 52 / 48 / 43	55 / 54 / 52 / 48
	UNIT DIMENSION	HEIGHT		mm/in	430 / 16.9	430 / 16.9
		WIDTH		mm/in	1426 / 56.1	1655 / 65.2
		DEPTH		mm/in	826 / 32.5	826 / 32.5
	PACKING DIMENSION	HEIGHT		mm/in	612 / 24.1	612 / 24.1
		WIDTH		mm/in	1535 / 60.4	1765 / 69.5
		DEPTH		mm/in	974 / 38.3	974 / 38.3
	UNIT WEIGHT			kg/lb	92 / 203	119 / 262
	CONDENSATE DRAIN SIZE			mm/in	25.4 / 1.0	25.4 / 1.0
OUTDOOR UNIT	AIR FLOW			l/s / CFM	3304 / 7000	
	SOUND PRESSURE LEVEL			dBA	64	
	UNIT DIMENSION	HEIGHT		mm/in	1041 / 40.98	
		WIDTH		mm/in	981 / 38.62	
		DEPTH		mm/in	981 / 38.62	
	PACKING DIMENSION	HEIGHT		mm/in	1224 / 48.2	
		WIDTH		mm/in	1175 / 46.3	
		DEPTH		mm/in	1150 / 45.3	
	UNIT WEIGHT			kg/lb	170 / 374	184 / 405
	PIPE CONNECTION	TYPE			BRAZING	
		SIZE	LIQUID	mm/in	12.7 / 1/2	15.9 / 5/8
			GAS	mm/in	25.6 / 1-1/8	25.6 / 1-1/8
REFRIGERANT CHARGE				kg/lb	7.00 / 15.43	7.80 / 17.20

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ARI 210/240-94.
3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
a) COOLING - 26.7°C DB / 19.4°C WB INDOOR AND 35.0°C DB / 23.9°C WB OUTDOOR
b) HEATING - 21.1°C DB INDOOR AND 8.3°C DB / 6.1°C WB OUTDOOR
4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.
5) EER/COP CALCULATION IS BASED ON EFFECTIVE POWER INPUT AS PER ISO 5151.

Components Data (R22)

MODEL	**INDOOR UNIT**			**MCC 075D**	**MCC 100D**
	OUTDOOR UNIT			**MMC 075D**	**MMC 100D**
INDOOR FAN	**TYPE**			CENTRIFUGAL	
	QUANTITY			2	2
	MATERIAL			ZINC COATED STEEL	ZINC COATED STEEL
	DRIVE			DIRECT	DIRECT
	DIAMETER		**mm/in**	228.6 / 9.0	228.6 / 9.0
	LENGTH		**mm/in**	177.8 / 7.0	228.6 / 9.0
INDOOR FAN MOTOR	**TYPE**			INDUCTION	
	QUANTITY			1	1
	INDEX OF PROTECTION (IP)			N/A	N/A
OUTDOOR FAN	**TYPE**			PROPELLER	
	QUANTITY			1	
	MATERIAL			ALUMINIUM	
	DRIVE			DIRECT	
	DIAMETER		**mm/in**	813 / 32	
OUTDOOR FAN MOTOR	**TYPE**			INDUCTION	
	QUANTITY			1	
	INDEX OF PROTECTION (IP)			IP54	IP54
COMPRESSOR	**TYPE**			SCROLL	
	OIL TYPE			SONTEX 200 LT	SONTEX 200 LT
	OIL AMOUNT		**cm^3/ fl.oz.**	2513 / 88.4	3253 / 114.5
INDOOR COIL	**TUBE**	**MATERIAL**		SEAMLESS COPPER	
		DIAMETER	**mm/in**	9.52 / 3/8	
		THICKNESS	**mm/in**	0.35 / 0.013	
	FIN	**MATERIAL**		ALUMINIUM	ALUMINIUM
		THICKNESS	**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA	**m^2/ft^2**	0.45 / 4.89	0.55 / 5.89
		ROW		4	4
		FIN PER INCH		12	14
OUTDOOR COIL	**TUBE**	**MATERIAL**		SEAMLESS COPPER	
		DIAMETER	**mm/in**	9.52 / 3/8	
		THICKNESS	**mm/in**	0.35 / 0.013	
	FIN	**MATERIAL**		ALUMINIUM	ALUMINIUM
		THICKNESS	**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA	**m^2/ft^2**	2.29 / 24.65	2.26 / 24.38
		ROW		1	2
		FIN PER INCH		20	16
AIR QUALITY	**FILTER**	**TYPE**		WASHABLE SARANET FILTER	
		QUANTITY	**pc**	2	
		SIZE **LENGTH**	**mm/in**	665 / 26.1	780 / 30.7
		SIZE **WIDTH**	**mm/in**	345 / 13.9	345 / 13.9
		SIZE **THICKNESS**	**mm/in**	4 / 0.16	4 / 0.16
CASING	**INDOOR UNIT**		**MATERIAL**	GALVANIZED MILD STEEL	
			FINSIHING	N/A	
			COLOUR	N/A	
	OUTDOOR UNIT		**MATERIAL**	ELECTRO GALVANIZED STEEL	
			FINISHING	EPOXY POLYESTER POWDER	
			COLOUR	WHITE	

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

Components Data (R22)

MODEL	**INDOOR UNIT**			**MCC 075DR**	**MCC 100DR**
	OUTDOOR UNIT			**MMC 075ER**	**MMC 100ER**
INDOOR FAN	**TYPE**			CENTRIFUGAL	
	QUANTITY			2	2
	MATERIAL			ZINC COATED STEEL	ZINC COATED STEEL
	DRIVE			DIRECT	DIRECT
	DIAMETER		**mm/in**	228.6 / 9.0	228.6 / 9.0
	LENGTH		**mm/in**	177.8 / 7.0	228.6 / 9.0
INDOOR FAN MOTOR	**TYPE**			INDUCTION	
	QUANTITY			1	1
	INDEX OF PROTECTION (IP)			N/A	N/A
OUTDOOR FAN	**TYPE**			PROPELLER	
	QUANTITY			1	
	MATERIAL			ALUMINIUM	
	DRIVE			DIRECT	
	DIAMETER		**mm/in**	813 / 32	
OUTDOOR FAN MOTOR	**TYPE**			INDUCTION	
	QUANTITY			1	
	INDEX OF PROTECTION (IP)			IP54	IP54
COMPRESSOR	**TYPE**			SCROLL	
	OIL TYPE			SONTEX 200 LT	SONTEX 200 LT
	OIL AMOUNT		**cm^3/ fl.oz.**	2513 / 88.4	3253 / 114.5
INDOOR COIL	**TUBE**	**MATERIAL**		SEAMLESS COPPER	
		DIAMETER	**mm/in**	9.52 / 3/8	
		THICKNESS	**mm/in**	0.35 / 0.013	
	FIN	**MATERIAL**		ALUMINIUM	ALUMINIUM
		THICKNESS	**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA	**m^2/ft^2**	0.45 / 4.89	0.55 / 5.89
		ROW		4	4
		FIN PER INCH		12	14
OUTDOOR COIL	**TUBE**	**MATERIAL**		SEAMLESS INNER GROOVED COPPER	
		DIAMETER	**mm/in**	9.52 / 3/8	
		THICKNESS	**mm/in**	0.35 / 0.013	
	FIN	**MATERIAL**		ALUMINIUM (HYDROPHILIC FIN)	ALUMINIUM (HYDROPHILIC FIN)
		THICKNESS	**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA	**m^2/ft^2**	2.29 / 24.65	2.29 / 24.65
		ROW		1	2
		FIN PER INCH		20	16
AIR QUALITY	**FILTER**	**TYPE**		WASHABLE SARANET FILTER	
		QUANTITY	**pc**	2	
		SIZE **LENGTH**	**mm/in**	665 / 26.1	780 / 30.7
		SIZE **WIDTH**	**mm/in**	345 / 13.9	345 / 13.9
		SIZE **THICKNESS**	**mm/in**	4 / 0.16	4 / 0.16
CASING	**INDOOR UNIT**		**MATERIAL**	GALVANIZED MILD STEEL	
			FINSIHING	N/A	
			COLOUR	N/A	
	OUTDOOR UNIT		**MATERIAL**	ELECTRO GALVANIZED STEEL	
			FINISHING	EPOXY POLYESTER POWDER	
			COLOUR	WHITE	

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Components Data (R407C)

MODEL	**INDOOR UNIT**				**MCC 075D**	**MCC 100D**
	OUTDOOR UNIT				**M4MC 075D**	**M4MC 100D**
INDOOR FAN	**TYPE**				CENTRIFUGAL	
	QUANTITY				2	2
	MATERIAL				ZINC COATED STEEL	ZINC COATED STEEL
	DRIVE				DIRECT	DIRECT
	DIAMETER			**mm/in**	228.6 / 9.0	228.6 / 9.0
	LENGTH			**mm/in**	177.8 / 7.0	228.6 / 9.0
INDOOR FAN MOTOR	**TYPE**				INDUCTION	
	QUANTITY				1	1
	INDEX OF PROTECTION (IP)				N/A	N/A
OUTDOOR FAN	**TYPE**				PROPELLER	
	QUANTITY				1	
	MATERIAL				ALUMINIUM	
	DRIVE				DIRECT	
	DIAMETER			**mm/in**	813 / 32	
OUTDOOR FAN MOTOR	**TYPE**				INDUCTION	
	QUANTITY				1	
	INDEX OF PROTECTION (IP)				IP54	N/A
COMPRESSOR	**TYPE**				SCROLL	
	OIL TYPE				POE	POE
	OIL AMOUNT			**cm^3/ fl.oz.**	2513 / 88.4	3253 / 114.5
INDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS INNER GROOVED COPPER	SEAMLESS COPPER
		DIAMETER		**mm/in**	9.52 / 3/8	9.52 / 3/8
		THICKNESS		**mm/in**	0.35 / 0.013	0.35 / 0.013
	FIN	**MATERIAL**			ALUMINIUM	ALUMINIUM
		THICKNESS		**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA		**m^2/ft^2**	0.45 / 4.89	0.55 / 5.89
		ROW			4	4
		FIN PER INCH			12	14
OUTDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS COPPER	
		DIAMETER		**mm/in**	9.52 / 3/8	
		THICKNESS		**mm/in**	0.35 / 0.013	
	FIN	**MATERIAL**			ALUMINIUM	ALUMINIUM
		THICKNESS		**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA		**m^2/ft^2**	2.29 / 24.72	2.29 / 24.72
		ROW			1	2
		FIN PER INCH			20	16
AIR QUALITY	**FILTER**	**TYPE**			WASHABLE SARANET FILTER	
		QUANTITY		**pc**	2	
		SIZE	**LENGTH**	**mm/in**	665 / 26.1	780 / 30.7
			WIDTH	**mm/in**	345 / 13.9	345 / 13.9
			THICKNESS	**mm/in**	4 / 0.16	4 / 0.16
CASING	**INDOOR UNIT**			**MATERIAL**	GALVANIZED MILD STEEL	
				FINSIHING	N/A	
				COLOUR	N/A	
	OUTDOOR UNIT			**MATERIAL**	ELECTRO GALVANIZED STEEL	
				FINISHING	EPOXY POLYESTER POWDER	
				COLOUR	WHITE	

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Components Data (R407C)

MODEL	**INDOOR UNIT**				**MCC 075DR**	**MCC 100DR**
	OUTDOOR UNIT				**M4MC 075ER**	**M4MC 100ER**
INDOOR FAN	**TYPE**				CENTRIFUGAL	
	QUANTITY				2	2
	MATERIAL				ZINC COATED STEEL	ZINC COATED STEEL
	DRIVE				DIRECT	DIRECT
	DIAMETER			**mm/in**	228.6 / 9.0	228.6 / 9.0
	LENGTH			**mm/in**	177.8 / 7.0	228.6 / 9.0
INDOOR FAN MOTOR	**TYPE**				INDUCTION	
	QUANTITY				1	1
	INDEX OF PROTECTION (IP)				N/A	N/A
OUTDOOR FAN	**TYPE**				PROPELLER	
	QUANTITY				1	
	MATERIAL				ALUMINIUM	
	DRIVE				DIRECT	
	DIAMETER			**mm/in**	812.8 / 32.0	
OUTDOOR FAN MOTOR	**TYPE**				INDUCTION	
	QUANTITY				1	
	INDEX OF PROTECTION (IP)				N/A	N/A
COMPRESSOR	**TYPE**				SCROLL	
	OIL TYPE				SONTEX 200 LT	SONTEX 200 LT
	OIL AMOUNT			**cm^3/ fl.oz.**	2513 / 88.4	3253 / 114.5
INDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS INNER GROOVED COPPER	SEAMLESS COPPER
		DIAMETER		**mm/in**	9.52 / 3/8	9.52 / 3/8
		THICKNESS		**mm/in**	0.35 / 0.013	0.35 / 0.013
	FIN	**MATERIAL**			ALUMINIUM	ALUMINIUM
		THICKNESS		**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA		**m^2/ft^2**	0.45 / 4.89	0.55 / 5.89
		ROW			4	4
		FIN PER INCH			12	14
OUTDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS INNER GROOVED COPPER	
		DIAMETER		**mm/in**	9.52 / 3/8	
		THICKNESS		**mm/in**	0.35 / 0.013	
	FIN	**MATERIAL**			ALUMINIUM	ALUMINIUM
		THICKNESS		**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA		**m^2/ft^2**	2.29 / 24.65	2.29 / 24.65
		ROW			1	2
		FIN PER INCH			20	16
AIR QUALITY	**FILTER**	**TYPE**			WASHABLE SARANET FILTER	
		QUANTITY		**pc**	2	
		SIZE	**LENGTH**	**mm/in**	665 / 26.1	780 / 30.7
			WIDTH	**mm/in**	345 / 13.9	345 / 13.9
			THICKNESS	**mm/in**	4 / 0.16	4 / 0.16
CASING	**INDOOR UNIT**			**MATERIAL**	GALVANIZED MILD STEEL	
				FINSIHING	N/A	
				COLOUR	N/A	
	OUTDOOR UNIT			**MATERIAL**	ELECTRO GALVANIZED STEEL	
				FINISHING	EPOXY POLYESTER POWDER	
				COLOUR	WHITE	

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Safety Devices

MODEL	INDOOR UNIT			MCC 075D	MCC 100D
	OUTDOOR UNIT			MMC 075D	MMC 100D
SAFETY DEVICE	HIGH PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	2937 / 426	2937 / 426
		CLOSE	kPa / psi	2413 / 350	2413 / 350
	LOW PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	124 / 18	124 / 18
		CLOSE	kPa / psi	193 / 28	193 / 28
	PHASE SEQUENCER			YES	YES
	DISCHARGE THERMOSTAT SETTING		°C / °F	130 / 266	130 / 266

MODEL	INDOOR UNIT			MCC 075DR	MCC 100DR
	OUTDOOR UNIT			MMC 075ER	MMC 100ER
SAFETY DEVICE	HIGH PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	2937 / 426	2937 / 426
		CLOSE	kPa / psi	2413 / 350	2413 / 350
	LOW PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	124 / 18	124 / 18
		CLOSE	kPa / psi	193 / 28	193 / 28
	PHASE SEQUENCER			YES	YES
	DISCHARGE THERMOSTAT SETTING		°C / °F	130 / 266	130 / 266

MODEL	INDOOR UNIT			MCC 075D	MCC 100D
	OUTDOOR UNIT			M4MC 075D	M4MC 100D
SAFETY DEVICE	HIGH PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	3241 / 470	3241 / 470
		CLOSE	kPa / psi	2648 / 384	2648 / 384
	LOW PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	124 / 18	124 / 18
		CLOSE	kPa / psi	193 / 28	193 / 28
	PHASE SEQUENCER			YES	YES
	DISCHARGE THERMOSTAT SETTING		°C / °F	130 / 266	130 / 266

MODEL	INDOOR UNIT			MCC 075DR	MCC 100DR
	OUTDOOR UNIT			M4MC 075ER	M4MC 100ER
SAFETY DEVICE	HIGH PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	3241 / 470	3241 / 470
		CLOSE	kPa / psi	2648 / 384	2648 / 384
	LOW PRESSURE SWITCH	TYPE		NC	NC
		OPEN	kPa / psi	124 / 18	124 / 18
		CLOSE	kPa / psi	193 / 28	193 / 28
	PHASE SEQUENCER			YES	YES
	DISCHARGE THERMOSTAT SETTING		°C / °F	130 / 266	130 / 266

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

Performance Data

Performance Table

Interpolation and Extrapolation method can be used to get the total capacity, TC and sensible capacity, SC at those temperatures which are not stated out in the table.

Example:

Model: MCC 075D – MMC 075D
Indoor Condition: 23°C DB, 15°C WB
Outdoor Condition: 37°C DB

Solution:

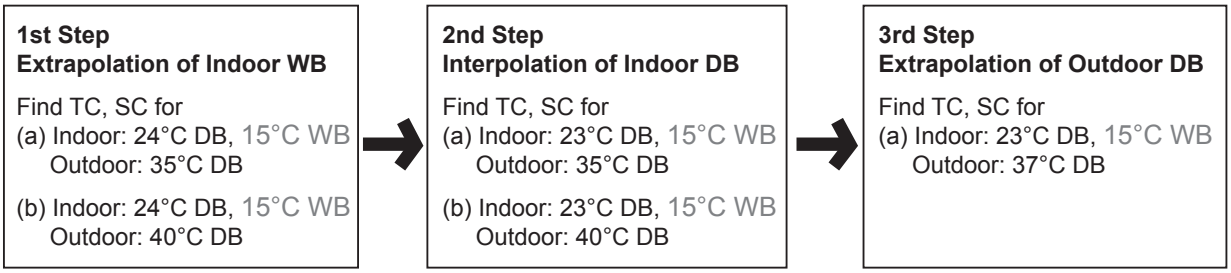
Overall
Based on the Performance table on Pg.41,

1. Refer to the Indoor DB column,
   - 23°C is located between 20°C and 24°C (Thus, Interpolation need to be applied)

2. Refer to the Indoor WB column,
   - 15°C only available in the case of Indoor DB = 20°C. (Thus, Extrapolation between 16°C WB and 17°C WB during 24°C indoor DB is required)

3. Refer to the Outdoor DB column,
   - 37°C is located between 35°C and 40°C. (Thus, Interpolation need to be applied)

Please follow the steps below in order to get the required capacity.



Details:

1st Step:

To obtain the Total capacity and Sensible capacity for
(a) Indoor Condition: 24°C DB, 15°C WB
Outdoor Condition: 35°C DB

Indoor DB ˚C	Indoor WB ˚C	Outdoor DB, ˚C			
			35		
			TC (kW)	SC (kW)	
			⋮	⋮	
24	15	- - - - - - - - - - - -	X_1	y_1	
	16		20.171	15.069	
	17		20.701	14.560	

Total capacity, TC

=> X_1 = 19.640kW (Same as Total capacity at 20°C Indoor DB / 15°C Indoor WB & 35°C Outdoor WB)*

Sensible capacity, SC

Extrapolation Method:

$$\Rightarrow \frac{17^{\circ}C - 15^{\circ}C}{17^{\circ}C - 16^{\circ}C} = \frac{14.560kW - y_1}{14.560kW - 15.069kW}$$

=> y_1 = 15.578kW

(b) Indoor Condition: 24°C DB, 15°C WB
Outdoor Condition: 40°C DB

Indoor DB ˚C	Indoor WB ˚C	Outdoor DB, ˚C			
			40		
			TC (kW)	SC (kW)	
			⋮	⋮	
24	15	- - - - - - - - - - - -	X_2	y_2	
	16		18.742	13.860	
	17		19.340	13.523	

Total capacity, TC

=> X_2 = 18.144kW *(Same as Total capacity at 20°C Indoor DB / 15°C Indoor WB & 40°C Outdoor WB)**

Sensible capacity, SC

Extrapolation Method:

$$\Rightarrow \frac{17^{\circ}C - 15^{\circ}C}{17^{\circ}C - 16^{\circ}C} = \frac{13.523kW - y_2}{13.523kW - 13.860kW}$$

=> y_2 = 14.197kW

** This is due to 2 different conditions with same WB temperature, will have the same level of enthalpy. For more details, please refer to psychrometrics chart*

2nd Step:

To obtain the Total capacity and Sensible capacity for
(a) Indoor Condition: 23°C DB, 15°C WB
Outdoor Condition: 35°C DB

Indoor DB ˚C	**Indoor WB ˚C**	**Outdoor DB, ˚C**			
			35		
			TC (kW)	**SC (kW)**	
			⋮	⋮	
20	**15**		19.640	11.235	
23	**15**	- - - - - - - - - - - -	X_3	y_3	
24	**15**		19.640	15.578	

Total capacity, TC

=> X_3 = 19.640kW *(Same as Total capacity at 20°C Indoor DB / 15°C Indoor WB & 35°C Outdoor WB)**

Sensible capacity, SC

Interpolation Method:

$$\Rightarrow \frac{24^{\circ}C - 20^{\circ}C}{24^{\circ}C - 23^{\circ}C} = \frac{15.578kW - 11.235kW}{15.578kW - y_3}$$

=> y_3 = 14.492kW

(b) Indoor Condition: 23°C DB, 15°C WB
Outdoor Condition: 40°C DB

Indoor DB ˚C	**Indoor WB ˚C**	**Outdoor DB, ˚C**			
			35		
			TC (kW)	**SC (kW)**	
			⋮	⋮	
20	**15**		18.144	9.854	
23	**15**	- - - - - - - - - - - -	X_4	y_4	
24	**15**		18.144	14.197	

Total capacity, TC

=> X_4 = 18.144kW *(Same as Total capacity at 20°C Indoor DB / 15°C Indoor WB & 40°C Outdoor WB)**

Sensible capacity, SC

Interpolation Method:

$$\Rightarrow \frac{24^{\circ}C - 20^{\circ}C}{24^{\circ}C - 23^{\circ}C} = \frac{14.197kW - 9.854kW}{14.197kW - y_1}$$

=> y_4 = 13.111kW

** This is due to 2 different conditions with same WB temperature, will have the same level of enthalpy. For more details, please refer to psychrometrics chart*

3rd Step:

To obtain the Total capacity and Sensible capacity for
(a) Indoor Condition: 23°C DB, 15°C WB
Outdoor Condition: 37°C DB

Indoor DB ˚C	Indoor WB ˚C		Outdoor DB, ˚C					
			35		37		40	
			TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)
			⋮	⋮	⋮	⋮	⋮	⋮
23	**15**	– – – –	19.640	14.492	x	y	18.144	13.111

Total capacity, TC

Interpolation Method:

$$\Rightarrow \frac{40^{\circ}C - 35^{\circ}C}{40^{\circ}C - 37^{\circ}C} = \frac{18.144kW - 19.640kW}{18.144kW - x}$$

=> x = 19.042kW

Sensible capacity, SC

Interpolation Method:

$$\Rightarrow \frac{40^{\circ}C - 35^{\circ}C}{40^{\circ}C - 37^{\circ}C} = \frac{13.111kW - 14.492kW}{13.111kW - y}$$

=> y = 13.940kW

R22 Models
(Cooling Only)
Model : MCC 075D / MMC 075D

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	24.127	15.380	22.632	13.998	21.136	12.617	19.640	11.235	18.144	9.854	16.349	8.196
	16	24.455	14.355	23.027	13.145	21.599	11.936	20.171	10.727	18.742	9.517	17.028	8.066
24	16	24.455	18.697	23.027	17.487	21.599	16.278	20.171	15.069	18.742	13.860	17.028	12.408
	17	24.783	17.672	23.423	16.634	22.062	15.597	20.701	14.560	19.340	13.523	17.708	12.279
	18	25.111	16.646	23.818	15.781	22.525	14.917	21.232	14.052	19.939	13.187	18.387	12.149
	19	25.439	15.621	24.214	14.928	22.988	14.236	21.762	13.543	20.537	12.851	19.066	12.020
	20	25.764	14.586	24.582	13.985	23.400	13.383	22.217	12.782	21.035	12.181	19.616	11.459
28	18	25.111	20.989	23.818	20.124	22.525	19.259	21.232	18.394	19.939	17.529	18.387	16.492
	19	25.439	19.963	24.214	19.271	22.988	18.578	21.762	17.886	20.537	17.193	19.066	16.362
	20	25.764	18.928	24.582	18.327	23.400	17.726	22.217	17.124	21.035	16.523	19.616	15.802
	21	26.088	17.887	24.932	17.323	23.777	16.759	22.621	16.195	21.466	15.631	20.079	14.954
	22	26.411	16.845	25.282	16.319	24.154	15.792	23.025	15.265	21.897	14.738	20.542	14.106
	23	26.734	15.804	25.632	15.314	24.531	14.825	23.429	14.335	22.328	13.846	21.006	13.258
	24	27.057	14.763	25.982	14.310	24.908	13.858	23.833	13.406	22.759	12.953	21.469	12.410
30	20	25.764	21.099	24.582	20.498	23.400	19.897	22.217	19.296	21.035	18.694	19.616	17.973
	21	26.088	20.058	24.932	19.494	23.777	18.930	22.621	18.366	21.466	17.802	20.079	17.125
	22	26.411	19.017	25.282	18.490	24.154	17.963	23.025	17.436	21.897	16.909	20.542	16.277
	23	26.734	17.975	25.632	17.486	24.531	16.996	23.429	16.506	22.328	16.017	21.006	15.429
	24	27.057	16.934	25.982	16.481	24.908	16.029	23.833	15.577	22.759	15.124	21.469	14.582

Model : MCC 100D / MMC 100D

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	32.860	20.133	30.721	18.230	28.582	16.326	26.443	14.422	24.305	12.518	21.738	10.234
	16	33.230	18.434	31.184	16.834	29.138	15.233	27.092	13.633	25.046	12.033	22.590	10.113
24	16	33.230	24.647	31.184	23.047	29.138	21.447	27.092	19.846	25.046	18.246	22.590	16.326
	17	33.601	22.947	31.647	21.651	29.694	20.354	27.740	19.058	25.787	17.761	23.443	16.205
	18	33.971	21.248	32.111	20.255	30.250	19.262	28.389	18.269	26.528	17.276	24.295	16.084
	19	34.342	19.548	32.574	18.859	30.805	18.170	29.037	17.480	27.269	16.791	25.147	15.964
	20	34.710	17.834	33.015	17.322	31.320	16.811	29.626	16.300	27.931	15.789	25.897	15.176
28	18	33.971	27.461	32.111	26.468	30.250	25.475	28.389	24.482	26.528	23.489	24.295	22.298
	19	34.342	25.761	32.574	25.072	30.805	24.383	29.037	23.693	27.269	23.004	25.147	22.177
	20	34.710	24.047	33.015	23.536	31.320	23.025	29.626	22.513	27.931	22.002	25.897	21.389
	21	35.077	22.322	33.442	21.906	31.808	21.489	30.174	21.073	28.540	20.656	26.578	20.156
	22	35.443	20.598	33.870	20.276	32.296	19.954	30.722	19.632	29.148	19.310	27.260	18.923
	23	35.810	18.873	34.297	18.645	32.784	18.418	31.270	18.191	29.757	17.963	27.941	17.691
	24	36.177	17.148	34.724	17.015	33.271	16.883	31.819	16.750	30.366	16.617	28.623	16.458
30	20	34.710	27.153	33.015	26.642	31.320	26.131	29.626	25.620	27.931	25.109	25.897	24.496
	21	35.077	25.429	33.442	25.012	31.808	24.596	30.174	24.179	28.540	23.763	26.578	23.263
	22	35.443	23.704	33.870	23.382	32.296	23.060	30.722	22.738	29.148	22.416	27.260	22.030
	23	35.810	21.979	34.297	21.752	32.784	21.525	31.270	21.297	29.757	21.070	27.941	20.797
	24	36.177	20.255	34.724	20.122	33.271	19.989	31.819	19.856	30.366	19.724	28.623	19.564

R22 Models
(Heat Pump)

Model : MCC 075DR / MMC 075ER

Cooling Mode

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	24.127	15.380	22.632	13.998	21.136	12.617	19.640	11.235	18.144	9.854	16.349	8.196
	16	24.455	14.355	23.027	13.145	21.599	11.936	20.171	10.727	18.742	9.517	17.028	8.066
24	16	24.455	18.697	23.027	17.487	21.599	16.278	20.171	15.069	18.742	13.860	17.028	12.408
	17	24.783	17.672	23.423	16.634	22.062	15.597	20.701	14.560	19.340	13.523	17.708	12.279
	18	25.111	16.646	23.818	15.781	22.525	14.917	21.232	14.052	19.939	13.187	18.387	12.149
	19	25.439	15.621	24.214	14.928	22.988	14.236	21.762	13.543	20.537	12.851	19.066	12.020
	20	25.764	14.586	24.582	13.985	23.400	13.383	22.217	12.782	21.035	12.181	19.616	11.459
28	18	25.111	20.989	23.818	20.124	22.525	19.259	21.232	18.394	19.939	17.529	18.387	16.492
	19	25.439	19.963	24.214	19.271	22.988	18.578	21.762	17.886	20.537	17.193	19.066	16.362
	20	25.764	18.928	24.582	18.327	23.400	17.726	22.217	17.124	21.035	16.523	19.616	15.802
	21	26.088	17.887	24.932	17.323	23.777	16.759	22.621	16.195	21.466	15.631	20.079	14.954
	22	26.411	16.845	25.282	16.319	24.154	15.792	23.025	15.265	21.897	14.738	20.542	14.106
	23	26.734	15.804	25.632	15.314	24.531	14.825	23.429	14.335	22.328	13.846	21.006	13.258
	24	27.057	14.763	25.982	14.310	24.908	13.858	23.833	13.406	22.759	12.953	21.469	12.410
30	20	25.764	21.099	24.582	20.498	23.400	19.897	22.217	19.296	21.035	18.694	19.616	17.973
	21	26.088	20.058	24.932	19.494	23.777	18.930	22.621	18.366	21.466	17.802	20.079	17.125
	22	26.411	19.017	25.282	18.490	24.154	17.963	23.025	17.436	21.897	16.909	20.542	16.277
	23	26.734	17.975	25.632	17.486	24.531	16.996	23.429	16.506	22.328	16.017	21.006	15.429
	24	27.057	16.934	25.982	16.481	24.908	16.029	23.833	15.577	22.759	15.124	21.469	14.582

Heating Mode

ID DB°C	Outdoor WB°C												
	-9		-6		-5		6		12		15		18	
	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
15	15.421	15.421	17.978	17.978	18.830	18.830	28.204	28.204	33.318	33.318	35.875	35.875	38.431	38.431
17	15.361	15.361	17.716	17.716	18.500	18.500	27.009	27.009	32.425	32.425	34.882	34.882	37.339	37.339
19	15.300	15.300	17.453	17.453	18.171	18.171	25.814	25.814	31.531	31.531	33.889	33.889	36.247	36.247
21	15.240	15.240	17.191	17.191	17.842	17.842	24.619	24.619	30.638	30.638	32.896	32.896	35.155	35.155
23	14.900	14.900	16.859	16.859	17.513	17.513	24.452	24.452	29.745	29.745	31.904	31.904	34.062	34.062
25	14.560	14.560	16.527	16.527	17.183	17.183	24.285	24.285	28.852	28.852	30.911	30.911	32.970	32.970
27	14.220	14.220	16.195	16.195	16.854	16.854	24.118	24.118	27.959	27.959	29.918	29.918	31.878	31.878
	FROST REGION													

R22 Models
(Heat Pump)

Model : MCC 100DR / MMC 100ER

Cooling Mode

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	32.860	20.133	30.721	18.230	28.582	16.326	26.443	14.422	24.305	12.518	21.738	10.234
	16	33.230	18.434	31.184	16.834	29.138	15.233	27.092	13.633	25.046	12.033	22.590	10.113
24	16	33.230	24.647	31.184	23.047	29.138	21.447	27.092	19.846	25.046	18.246	22.590	16.326
	17	33.601	22.947	31.647	21.651	29.694	20.354	27.740	19.058	25.787	17.761	23.443	16.205
	18	33.971	21.248	32.111	20.255	30.250	19.262	28.389	18.269	26.528	17.276	24.295	16.084
	19	34.342	19.548	32.574	18.859	30.805	18.170	29.037	17.480	27.269	16.791	25.147	15.964
	20	34.710	17.834	33.015	17.322	31.320	16.811	29.626	16.300	27.931	15.789	25.897	15.176
28	18	33.971	27.461	32.111	26.468	30.250	25.475	28.389	24.482	26.528	23.489	24.295	22.298
	19	34.342	25.761	32.574	25.072	30.805	24.383	29.037	23.693	27.269	23.004	25.147	22.177
	20	34.710	24.047	33.015	23.536	31.320	23.025	29.626	22.513	27.931	22.002	25.897	21.389
	21	35.077	22.322	33.442	21.906	31.808	21.489	30.174	21.073	28.540	20.656	26.578	20.156
	22	35.443	20.598	33.870	20.276	32.296	19.954	30.722	19.632	29.148	19.310	27.260	18.923
	23	35.810	18.873	34.297	18.645	32.784	18.418	31.270	18.191	29.757	17.963	27.941	17.691
	24	36.177	17.148	34.724	17.015	33.271	16.883	31.819	16.750	30.366	16.617	28.623	16.458
30	20	34.710	27.153	33.015	26.642	31.320	26.131	29.626	25.620	27.931	25.109	25.897	24.496
	21	35.077	25.429	33.442	25.012	31.808	24.596	30.174	24.179	28.540	23.763	26.578	23.263
	22	35.443	23.704	33.870	23.382	32.296	23.060	30.722	22.738	29.148	22.416	27.260	22.030
	23	35.810	21.979	34.297	21.752	32.784	21.525	31.270	21.297	29.757	21.070	27.941	20.797
	24	36.177	20.255	34.724	20.122	33.271	19.989	31.819	19.856	30.366	19.724	28.623	19.564

Heating Mode

ID DB°C	Outdoor WB°C													
	-9		-6		-5		6		12		15		18	
	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
15	19.953	19.953	22.978	22.978	23.986	23.986	35.078	35.078	41.127	41.127	44.152	44.152	47.177	47.177
17	19.945	19.945	22.667	22.667	23.574	23.574	34.131	34.131	40.029	40.029	42.933	42.933	45.836	45.836
19	19.938	19.938	22.356	22.356	23.161	23.161	33.185	33.185	38.930	38.930	41.713	41.713	44.496	44.496
21	19.930	19.930	22.044	22.044	22.749	22.749	32.239	32.239	37.832	37.832	40.494	40.494	43.155	43.155
23	19.423	19.423	21.608	21.608	22.337	22.337	31.477	31.477	36.733	36.733	39.274	39.274	41.815	41.815
25	18.916	18.916	21.172	21.172	21.924	21.924	30.715	30.715	35.635	35.635	38.055	38.055	40.474	40.474
27	18.409	18.409	20.736	20.736	21.512	21.512	29.954	29.954	34.536	34.536	36.835	36.835	39.133	39.133
	FROST REGION													

R407C Models
(Cooling Only)

Model : MCC 075D / M4MC 075D

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	24.127	15.380	22.632	13.998	21.136	12.617	19.640	11.235	18.144	9.854	16.349	8.196
	16	24.455	14.355	23.027	13.145	21.599	11.936	20.171	10.727	18.742	9.517	17.028	8.066
24	16	24.455	18.697	23.027	17.487	21.599	16.278	20.171	15.069	18.742	13.860	17.028	12.408
	17	24.783	17.672	23.423	16.634	22.062	15.597	20.701	14.560	19.340	13.523	17.708	12.279
	18	25.111	16.646	23.818	15.781	22.525	14.917	21.232	14.052	19.939	13.187	18.387	12.149
	19	25.439	15.621	24.214	14.928	22.988	14.236	21.762	13.543	20.537	12.851	19.066	12.020
	20	25.764	14.586	24.582	13.985	23.400	13.383	22.217	12.782	21.035	12.181	19.616	11.459
28	18	25.111	20.989	23.818	20.124	22.525	19.259	21.232	18.394	19.939	17.529	18.387	16.492
	19	25.439	19.963	24.214	19.271	22.988	18.578	21.762	17.886	20.537	17.193	19.066	16.362
	20	25.764	18.928	24.582	18.327	23.400	17.726	22.217	17.124	21.035	16.523	19.616	15.802
	21	26.088	17.887	24.932	17.323	23.777	16.759	22.621	16.195	21.466	15.631	20.079	14.954
	22	26.411	16.845	25.282	16.319	24.154	15.792	23.025	15.265	21.897	14.738	20.542	14.106
	23	26.734	15.804	25.632	15.314	24.531	14.825	23.429	14.335	22.328	13.846	21.006	13.258
	24	27.057	14.763	25.982	14.310	24.908	13.858	23.833	13.406	22.759	12.953	21.469	12.410
30	20	25.764	21.099	24.582	20.498	23.400	19.897	22.217	19.296	21.035	18.694	19.616	17.973
	21	26.088	20.058	24.932	19.494	23.777	18.930	22.621	18.366	21.466	17.802	20.079	17.125
	22	26.411	19.017	25.282	18.490	24.154	17.963	23.025	17.436	21.897	16.909	20.542	16.277
	23	26.734	17.975	25.632	17.486	24.531	16.996	23.429	16.506	22.328	16.017	21.006	15.429
	24	27.057	16.934	25.982	16.481	24.908	16.029	23.833	15.577	22.759	15.124	21.469	14.582

Model : MCC 100D / M4MC 100D

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	32.860	20.133	30.721	18.230	28.582	16.326	26.443	14.422	24.305	12.518	21.738	10.234
	16	33.230	18.434	31.184	16.834	29.138	15.233	27.092	13.633	25.046	12.033	22.590	10.113
24	16	33.230	24.647	31.184	23.047	29.138	21.447	27.092	19.846	25.046	18.246	22.590	16.326
	17	33.601	22.947	31.647	21.651	29.694	20.354	27.740	19.058	25.787	17.761	23.443	16.205
	18	33.971	21.248	32.111	20.255	30.250	19.262	28.389	18.269	26.528	17.276	24.295	16.084
	19	34.342	19.548	32.574	18.859	30.805	18.170	29.037	17.480	27.269	16.791	25.147	15.964
	20	34.710	17.834	33.015	17.322	31.320	16.811	29.626	16.300	27.931	15.789	25.897	15.176
28	18	33.971	27.461	32.111	26.468	30.250	25.475	28.389	24.482	26.528	23.489	24.295	22.298
	19	34.342	25.761	32.574	25.072	30.805	24.383	29.037	23.693	27.269	23.004	25.147	22.177
	20	34.710	24.047	33.015	23.536	31.320	23.025	29.626	22.513	27.931	22.002	25.897	21.389
	21	35.077	22.322	33.442	21.906	31.808	21.489	30.174	21.073	28.540	20.656	26.578	20.156
	22	35.443	20.598	33.870	20.276	32.296	19.954	30.722	19.632	29.148	19.310	27.260	18.923
	23	35.810	18.873	34.297	18.645	32.784	18.418	31.270	18.191	29.757	17.963	27.941	17.691
	24	36.177	17.148	34.724	17.015	33.271	16.883	31.819	16.750	30.366	16.617	28.623	16.458
30	20	34.710	27.153	33.015	26.642	31.320	26.131	29.626	25.620	27.931	25.109	25.897	24.496
	21	35.077	25.429	33.442	25.012	31.808	24.596	30.174	24.179	28.540	23.763	26.578	23.263
	22	35.443	23.704	33.870	23.382	32.296	23.060	30.722	22.738	29.148	22.416	27.260	22.030
	23	35.810	21.979	34.297	21.752	32.784	21.525	31.270	21.297	29.757	21.070	27.941	20.797
	24	36.177	20.255	34.724	20.122	33.271	19.989	31.819	19.856	30.366	19.724	28.623	19.564

R407C Models
(Heat Pump)

Model : MCC 075DR / M4MC 075ER

Cooling Mode

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	24.127	15.380	22.632	13.998	21.136	12.617	19.640	11.235	18.144	9.854	16.349	8.196
	16	24.455	14.355	23.027	13.145	21.599	11.936	20.171	10.727	18.742	9.517	17.028	8.066
24	16	24.455	18.697	23.027	17.487	21.599	16.278	20.171	15.069	18.742	13.860	17.028	12.408
	17	24.783	17.672	23.423	16.634	22.062	15.597	20.701	14.560	19.340	13.523	17.708	12.279
	18	25.111	16.646	23.818	15.781	22.525	14.917	21.232	14.052	19.939	13.187	18.387	12.149
	19	25.439	15.621	24.214	14.928	22.988	14.236	21.762	13.543	20.537	12.851	19.066	12.020
	20	25.764	14.586	24.582	13.985	23.400	13.383	22.217	12.782	21.035	12.181	19.616	11.459
28	18	25.111	20.989	23.818	20.124	22.525	19.259	21.232	18.394	19.939	17.529	18.387	16.492
	19	25.439	19.963	24.214	19.271	22.988	18.578	21.762	17.886	20.537	17.193	19.066	16.362
	20	25.764	18.928	24.582	18.327	23.400	17.726	22.217	17.124	21.035	16.523	19.616	15.802
	21	26.088	17.887	24.932	17.323	23.777	16.759	22.621	16.195	21.466	15.631	20.079	14.954
	22	26.411	16.845	25.282	16.319	24.154	15.792	23.025	15.265	21.897	14.738	20.542	14.106
	23	26.734	15.804	25.632	15.314	24.531	14.825	23.429	14.335	22.328	13.846	21.006	13.258
	24	27.057	14.763	25.982	14.310	24.908	13.858	23.833	13.406	22.759	12.953	21.469	12.410
30	20	25.764	21.099	24.582	20.498	23.400	19.897	22.217	19.296	21.035	18.694	19.616	17.973
	21	26.088	20.058	24.932	19.494	23.777	18.930	22.621	18.366	21.466	17.802	20.079	17.125
	22	26.411	19.017	25.282	18.490	24.154	17.963	23.025	17.436	21.897	16.909	20.542	16.277
	23	26.734	17.975	25.632	17.486	24.531	16.996	23.429	16.506	22.328	16.017	21.006	15.429
	24	27.057	16.934	25.982	16.481	24.908	16.029	23.833	15.577	22.759	15.124	21.469	14.582

Heating Mode

ID DB°C	Outdoor WB°C														
	-9		-6		-5		6		12		15		18		
	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	
15	15.421	15.421	17.978	17.978	18.830	18.830	28.204	28.204	33.318	33.318	35.875	35.875	38.431	38.431	
17	15.361	15.361	17.716	17.716	18.500	18.500	27.009	27.009	32.425	32.425	34.882	34.882	37.339	37.339	
19	15.300	15.300	17.453	17.453	18.171	18.171	25.814	25.814	31.531	31.531	33.889	33.889	36.247	36.247	
21	15.240	15.240	17.191	17.191	17.842	17.842	24.619	24.619	30.638	30.638	32.896	32.896	35.155	35.155	
23	14.900	14.900	16.859	16.859	17.513	17.513	24.452	24.452	29.745	29.745	31.904	31.904	34.062	34.062	
25	14.560	14.560	16.527	16.527	17.183	17.183	24.285	24.285	28.852	28.852	30.911	30.911	32.970	32.970	
27	14.220	14.220	16.195	16.195	16.854	16.854	24.118	24.118	27.959	27.959	29.918	29.918	31.878	31.878	
	FROST REGION														

R407C Models
(Heat Pump)

Model : MCC 100DR / M4MC 100ER

Cooling Mode

ID DB°C	ID WB°C	Outdoor DB°C											
		20		25		30		35		40		46	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	32.860	20.133	30.721	18.230	28.582	16.326	26.443	14.422	24.305	12.518	21.738	10.234
	16	33.230	18.434	31.184	16.834	29.138	15.233	27.092	13.633	25.046	12.033	22.590	10.113
24	16	33.230	24.647	31.184	23.047	29.138	21.447	27.092	19.846	25.046	18.246	22.590	16.326
	17	33.601	22.947	31.647	21.651	29.694	20.354	27.740	19.058	25.787	17.761	23.443	16.205
	18	33.971	21.248	32.111	20.255	30.250	19.262	28.389	18.269	26.528	17.276	24.295	16.084
	19	34.342	19.548	32.574	18.859	30.805	18.170	29.037	17.480	27.269	16.791	25.147	15.964
	20	34.710	17.834	33.015	17.322	31.320	16.811	29.626	16.300	27.931	15.789	25.897	15.176
28	18	33.971	27.461	32.111	26.468	30.250	25.475	28.389	24.482	26.528	23.489	24.295	22.298
	19	34.342	25.761	32.574	25.072	30.805	24.383	29.037	23.693	27.269	23.004	25.147	22.177
	20	34.710	24.047	33.015	23.536	31.320	23.025	29.626	22.513	27.931	22.002	25.897	21.389
	21	35.077	22.322	33.442	21.906	31.808	21.489	30.174	21.073	28.540	20.656	26.578	20.156
	22	35.443	20.598	33.870	20.276	32.296	19.954	30.722	19.632	29.148	19.310	27.260	18.923
	23	35.810	18.873	34.297	18.645	32.784	18.418	31.270	18.191	29.757	17.963	27.941	17.691
	24	36.177	17.148	34.724	17.015	33.271	16.883	31.819	16.750	30.366	16.617	28.623	16.458
30	20	34.710	27.153	33.015	26.642	31.320	26.131	29.626	25.620	27.931	25.109	25.897	24.496
	21	35.077	25.429	33.442	25.012	31.808	24.596	30.174	24.179	28.540	23.763	26.578	23.263
	22	35.443	23.704	33.870	23.382	32.296	23.060	30.722	22.738	29.148	22.416	27.260	22.030
	23	35.810	21.979	34.297	21.752	32.784	21.525	31.270	21.297	29.757	21.070	27.941	20.797
	24	36.177	20.255	34.724	20.122	33.271	19.989	31.819	19.856	30.366	19.724	28.623	19.564

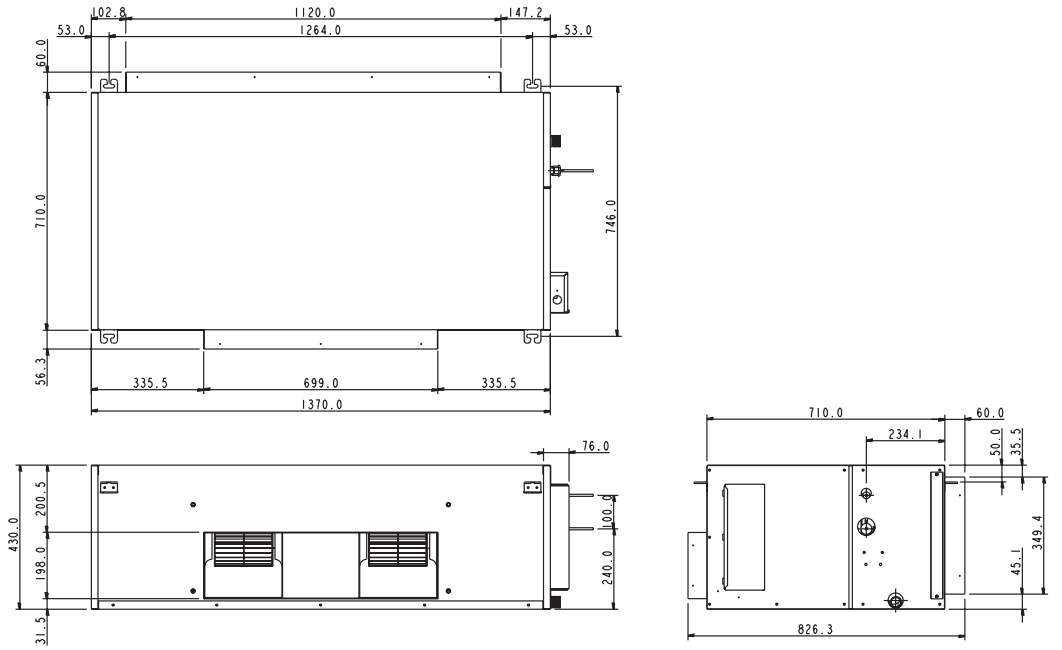
Heating Mode

ID DB°C	Outdoor WB°C													
	-9		-6		-5		6		12		15		18	
	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
15	19.953	19.953	22.978	22.978	23.986	23.986	35.078	35.078	41.127	41.127	44.152	44.152	47.177	47.177
17	19.945	19.945	22.667	22.667	23.574	23.574	34.131	34.131	40.029	40.029	42.933	42.933	45.836	45.836
19	19.938	19.938	22.356	22.356	23.161	23.161	33.185	33.185	38.930	38.930	41.713	41.713	44.496	44.496
21	19.930	19.930	22.044	22.044	22.749	22.749	32.239	32.239	37.832	37.832	40.494	40.494	43.155	43.155
23	19.423	19.423	21.608	21.608	22.337	22.337	31.477	31.477	36.733	36.733	39.274	39.274	41.815	41.815
25	18.916	18.916	21.172	21.172	21.924	21.924	30.715	30.715	35.635	35.635	38.055	38.055	40.474	40.474
27	18.409	18.409	20.736	20.736	21.512	21.512	29.954	29.954	34.536	34.536	36.835	36.835	39.133	39.133
	FROST REGION													

Dimensional Data

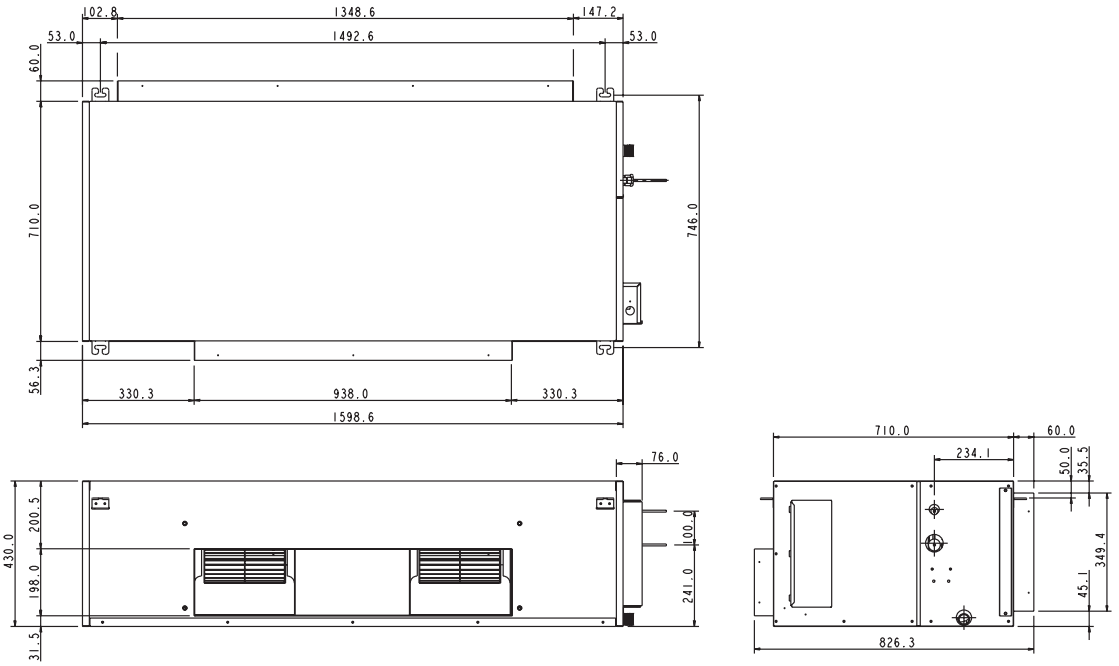
Outlines And Dimensions
Indoor Unit

Model: MCC 075D/DR



Note: All Dimension are in mm

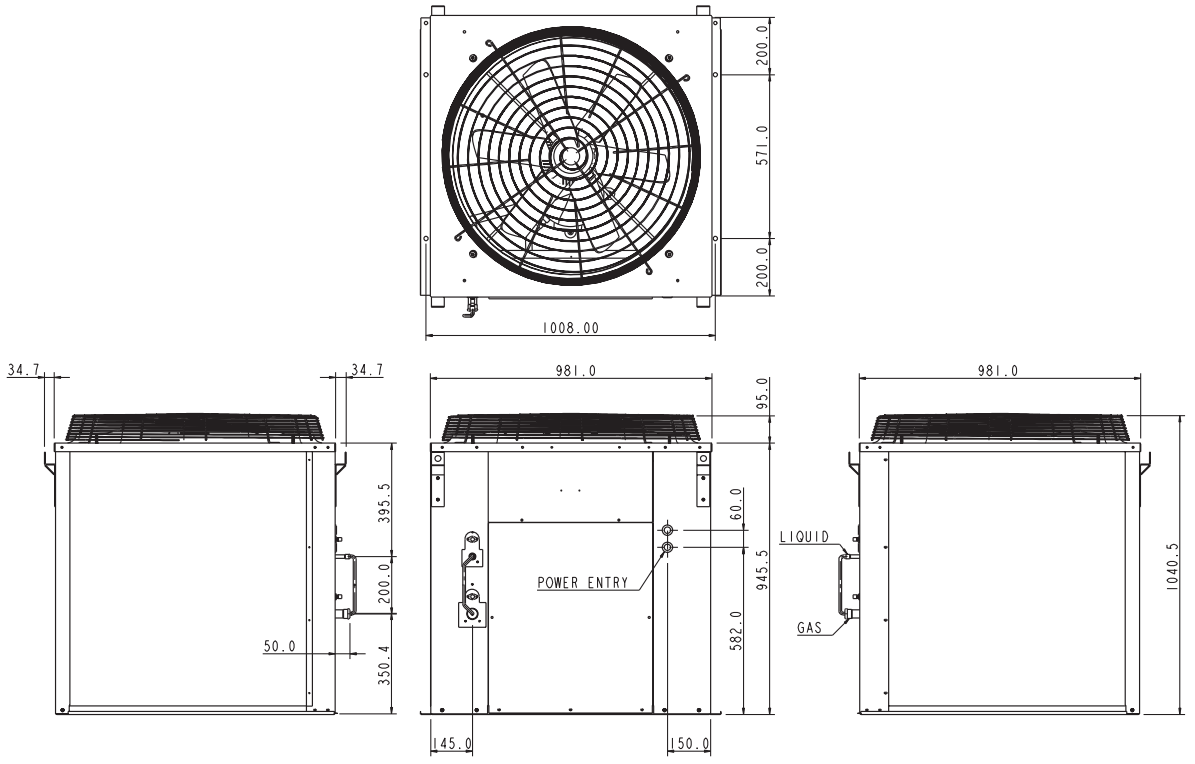
Model: MCC 100D/DR



Note: All Dimension are in mm

Outdoor Unit

Model: MMC / M4MC 075/100D/ER



Note: All Dimension are in mm

Electrical Data

Electrical Data - Cooling Only (R22)

MODEL	INDOOR UNIT		MCC 075D	MCC 100D
	OUTDOOR UNIT		MMC 075D	MMC 100D
INDOOR MOTOR	INSULATION GRADE		CLASS B	
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	
	RATED INPUT POWER	W	1061	1254
	RATED RUNNING CURRENT	A	4.51	5.79
	MOTOR OUTPUT	W	750	1000
	POLES		4	4
OUTDOOR MOTOR	INSULATION GRADE		CLASS F	
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	
	RATED INPUT POWER	W	600	
	RATED RUNNING CURRENT	A	1.2	
	MOTOR OUTPUT	W	350	
	POLES		6	
COMPRESSOR	INSULATION GRADE		N/A	N/A
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
	CAPACITOR	μF	NIL	NIL
	RATED INPUT POWER	W	6810	8968
	RATED RUNNING CURRENT	A	13.6	16.3
	LOCKED ROTOR AMP.	A	95	125

MODEL	INDOOR UNIT		MCC 075DR	MCC 100DR
	OUTDOOR UNIT		MMC 075ER	MMC 100ER
INDOOR MOTOR	INSULATION GRADE		CLASS B	
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	
	RATED INPUT POWER	W	1061	1254
	RATED RUNNING CURRENT	A	4.51	5.79
	MOTOR OUTPUT	W	750	1000
	POLES		4	4
OUTDOOR MOTOR	INSULATION GRADE		CLASS F	
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	
	RATED INPUT POWER	W	600	
	RATED RUNNING CURRENT	A	1.2	
	MOTOR OUTPUT	W	350	
	POLES		6	
COMPRESSOR	INSULATION GRADE		N/A	N/A
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
	CAPACITOR	μF	NIL	NIL
	RATED INPUT POWER (COOLING)	W	5695	8346
	RATED INPUT POWER (HEATING)	W	5545	7966
	RATED RUNNING CURRENT (COOLING)	A	10.9	14.8
	RATED RUNNING CURRENT (HEATING)	A	10.6	14.1
	LOCKED ROTOR AMP.	A	95	125

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2) ALL UNITS ARE BEING TESTED AND COMPLY TO ARI210/240-94.

Electrical Data - Cooling Only (R407C)

MODEL	INDOOR UNIT		MCC 075D	MCC 100D
	OUTDOOR UNIT		M4MC 075D	M4MC 100D
INDOOR MOTOR	INSULATION GRADE		CLASS B	
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	
	RATED INPUT POWER	W	1061	1254
	RATED RUNNING CURRENT	A	4.51	5.79
	MOTOR OUTPUT	W	750	1000
	POLES		4	4
OUTDOOR MOTOR	INSULATION GRADE		CLASS F	
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	
	RATED INPUT POWER	W	600	
	RATED RUNNING CURRENT	A	1.2	
	MOTOR OUTPUT	W	350	
	POLES		6	
COMPRESSOR	INSULATION GRADE		N/A	N/A
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
	CAPACITOR	μF	NIL	NIL
	RATED INPUT POWER	W	6045	9186
	RATED RUNNING CURRENT	A	11.1	15.9
	LOCKED ROTOR AMP.	A	95	125

MODEL	INDOOR UNIT		MCC 075DR	MCC 100DR
	OUTDOOR UNIT		M4MC 075ER	M4MC 100ER
INDOOR MOTOR	INSULATION GRADE		CLASS B	
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	
	RATED INPUT POWER	W	1061	1254
	RATED RUNNING CURRENT	A	4.51	5.79
	MOTOR OUTPUT	W	750	1000
	POLES		4	4
OUTDOOR MOTOR	INSULATION GRADE		CLASS F	
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	
	RATED INPUT POWER	W	600	
	RATED RUNNING CURRENT	A	1.2	
	MOTOR OUTPUT	W	350	
	POLES		6	
COMPRESSOR	INSULATION GRADE		N/A	N/A
	POWER SOURCE	V/Ph/Hz	380 - 415 / 3 / 50	380 - 415 / 3 / 50
	CAPACITOR	μF	NIL	NIL
	RATED INPUT POWER (COOLING)	W	6045	9186
	RATED INPUT POWER (HEATING)	W	6045	7425
	RATED RUNNING CURRENT (COOLING)	A	11.1	15.9
	RATED RUNNING CURRENT (HEATING)	A	11.1	16.5
	LOCKED ROTOR AMP.	A	95	125

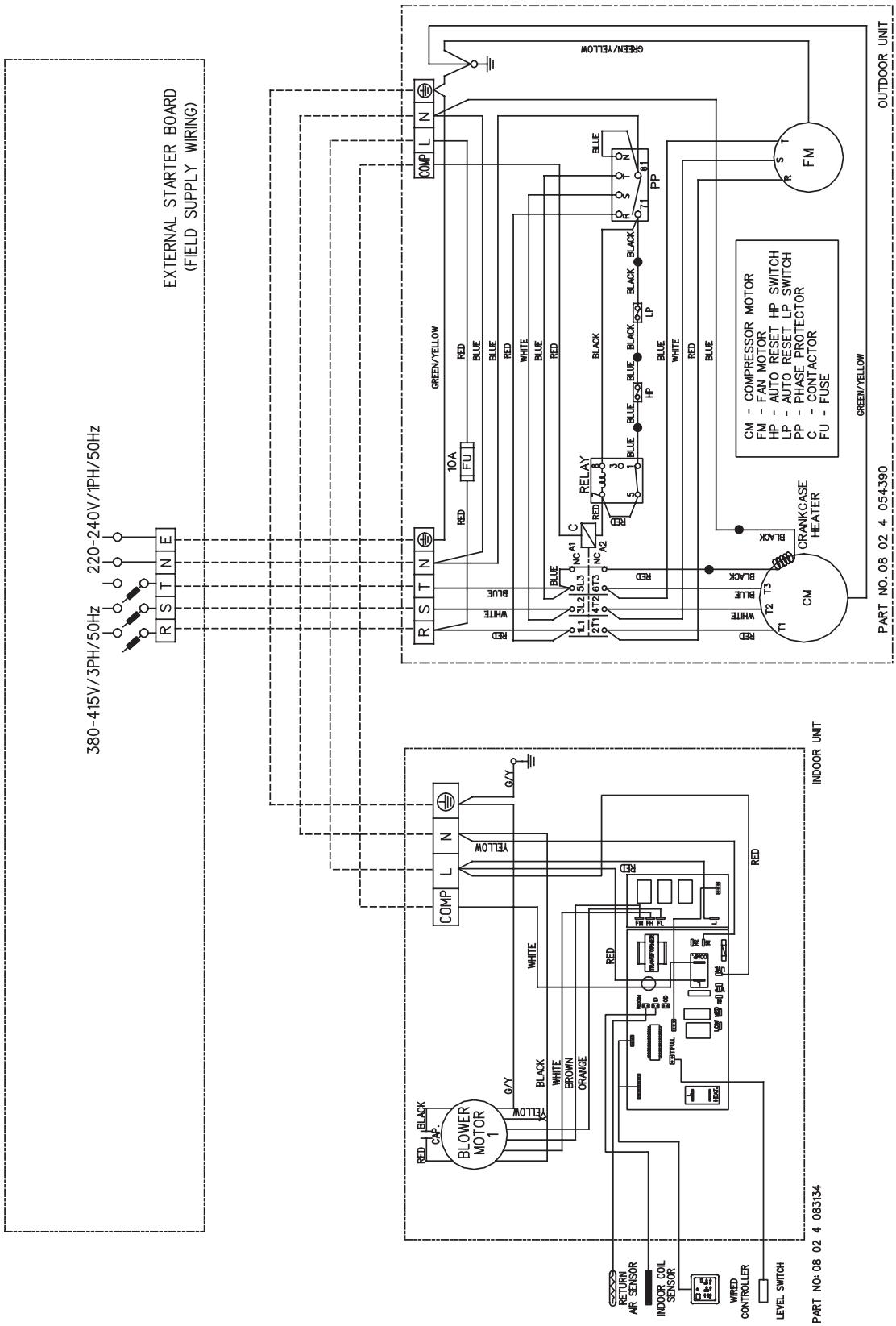
1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2) ALL UNITS ARE BEING TESTED AND COMPLY TO ARI210/240-94.

Wiring Diagrams

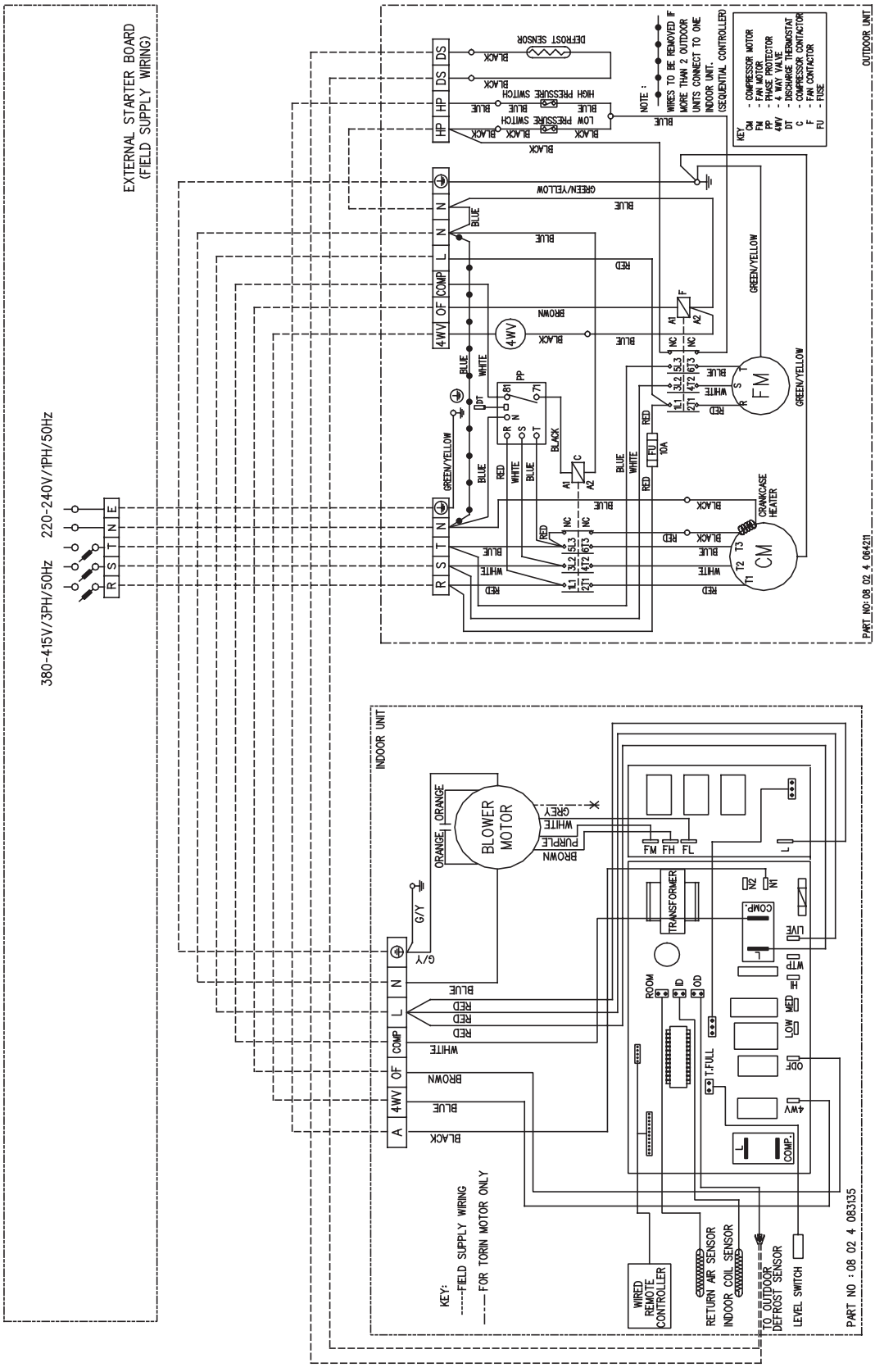
Cooling Only

Model: MCC 075/100D vs MMC / M4MC 075/100D



Heat Pump

Model: MCC 075/100DR vs Model: MMC / M4MC 075/100ER



Servicing And Maintenance

Warning: Disconnect from main supply before servicing the air conditioner

The unit is designed to give long life operation with minimum maintenance required. However, it should be regularly checked and the following items should be given due attention.

Components	Maintenance Procedures	Recommended Schedule
Air Filter (Indoor Unit)	1. Remove any dust adhering to the filter by using a vacuum cleaner or wash in lukewarm water (below 40˚C) with a neutral cleaning detergent. 2. Rinse the filter well and dry before placing it back onto the unit. **3. Note: Never use gasoline, volatile substances or chemicals to clean the filter.**	At least once every 2 weeks. More frequently if necessary.
Indoor Unit	1. Clean any dirt or dust on the grille or panel by wiping it with a soft cloth soaked in lukewarm water (below 40˚C) and a neutral detergent solution. **2. Note: Never use gasoline, volatile substances or chemicals to clean the indoor unit.**	At least once every 2 weeks. More frequently if necessary.
Condense Drain Pan & Pipe	1. Check the cleanliness and clean it if necessary. 2. Check the condensate water flow.	Every 3 months.
Indoor Fan	Check if there is any abnormal noise.	If necessary.
Indoor / Outdoor Coil	1. Check and remove the dirt between the fins. 2. Check and remove any obstacles which hinder air flow through the indoor or outdoor.	Every month.
Power Supply	1. Check the running current and voltage for indoor and outdoor unit. 2. Check the electrical wiring and tighten the wire onto the terminal block if necessary.	Every 2 months. Every year.
Compressor	No maintenance needed if refrigerant circuit remains sealed. However, check for refrigerant leak at joint and fitting.	Every 6 months.
Compressor Oil	Oil is factory charged. Not necessary to add oil if circuit remains sealed.	No maintenance required.
Fan Motor Oil	All motors are pre-lubricated and sealed at factory.	No maintenance required.

Pre Start Up Maintenance
(After Extended Shutdown)

- Inspect thoroughly and clean indoor and outdoor units.
- Clean or replace air filters.
- Clean condensates drain line.
- Clean clogged indoor and outdoor coils.
- Check fan imbalance before operation.
- Tighten all wiring connections and panels.
- Check for refrigerant leakage.

The design concept of the Condensing Unit is such that all servicing can be done from the front and side of the unit.

Upon removal of front and side panel, all the electrical “terminal box”, fan and motor assembly and compressor are easily accessible.

Under normal circumstances, these outdoor units only require a check and cleaning of air intake coil surfaces once quarterly. However, if a unit is installed in area subjected to much oil, mist and dust, the coil must be regularly cleaned by qualified Air Conditioner Service Technicians to ensure sufficient heat exchange and proper operation. Otherwise, the systems life span might be shortened.

CAUTION

When the compressor is to be stopped for a long time, the crankcase heater should be energized for at least 6 hours before start of operation.

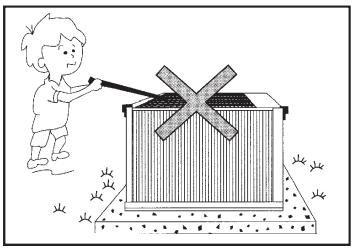
Do not charge OXYGEN, ACETYLENE or other flammable and poisonous gases into the refrigeration cycle when performing a leakage test or an airtight test. These types of gases are extremely dangerous, because explosion can occur.

It is recommended that nitrogen or refrigerant be charged for these types of tests.

Caution for Use

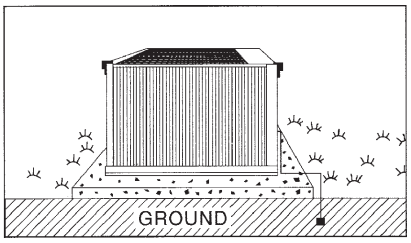
Bear the following points in mind to safeguard against malfunction and breakdown.

Do not stick any objects through the air outlet during operation because this may result to damage or injury.



The air conditioner must not re-start within 3 minutes after shutdown. (These models are equipped with a crankcase heater with the compressor).

Make sure the air conditioner is properly grounded by checking the ground terminal.

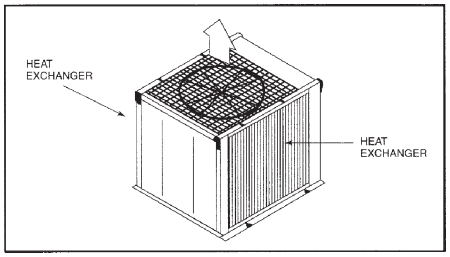


Maintenance

For superb performance and lasting durability, please do not forget to conduct proper and regular maintenance.

Cleaning the Outdoor Unit Heat Exchanger

If you use your air conditioner for prolonged period of time, the outdoor unit heat exchanger will become dirty impairing its function and reducing the performance of the air conditioner. Consult your local dealer about the cleaning of the heat exchanger.



Troubleshooting

When a malfunction of the air conditioner unit is detected, immediately switch off the main power supply before proceeding with the following troubleshooting procedures.
The following are common fault conditions and simple troubleshooting tips. If any other fault conditions which are not listed occur, contact your nearest local dealer. DO NOT attempt to troubleshoot the unit by yourself.

No	Fault conditions	Possible causes / corrective actions
1	The air conditioner unit will not resume after power failure.	• The auto restart function is not functioning. Please turn on the unit with the wireless / wired controller.
2	The compressor does not operate 3 minutes after the air conditioner unit is started.	• Protection against frequent starting. • Wait for 3 or 4 minutes for the compressor to start operating by it self.
3	The airflow is too slow or room cannot be cooled sufficiently.	• The air filter is dirty. • The doors and windows are opened. • The air suction and discharge of both indoor and outdoor units are clogged or blocked. • The regulated temperature or temperature setting is not low enough.
4	Discharge airflow has bad odor.	• Cigarettes, smoke particles, perfume and others, which might have adhered onto the coil, may cause odor. • Contact your nearest dealer.
5	Condensation on the front air grille of the indoor unit.	• This is caused by air humidity after an extended period of operation. • The set temperature is too low. Increase the temperature setting and operate the unit at high fan speed.
6	Water flowing out from the air conditioner.	• Switch off the unit and contact your nearest dealer. This might be due to tilted installation.
7	Hissing airflow sound from the air conditioner unit during operation.	• Liquid refrigerant flowing into the evaporator coil.
8	The wireless controller display is dim.	• The batteries are discharged. • The batteries are not correctly inserted. • The assembly is not good.
9	Compressor operates continuously.	• Dirty air filter. Clean the air filter. • Temperature setting too low (cooling). Use higher temperature setting. • Temperature setting too high (heating), Use lower temperature setting.
10	No cool air comes out during cooling cycle, or no hot air comes out during heating cycle.	• Temperature setting too high (cooling). Use lower temperature setting. • Temperature setting too low (heating). Use higher temperature setting.
11	On heating cycle, warm air does not come out.	• Unit is in defrost mode. Heating operation will resume after defrost cycle ends.

Diagnostic Guidelines

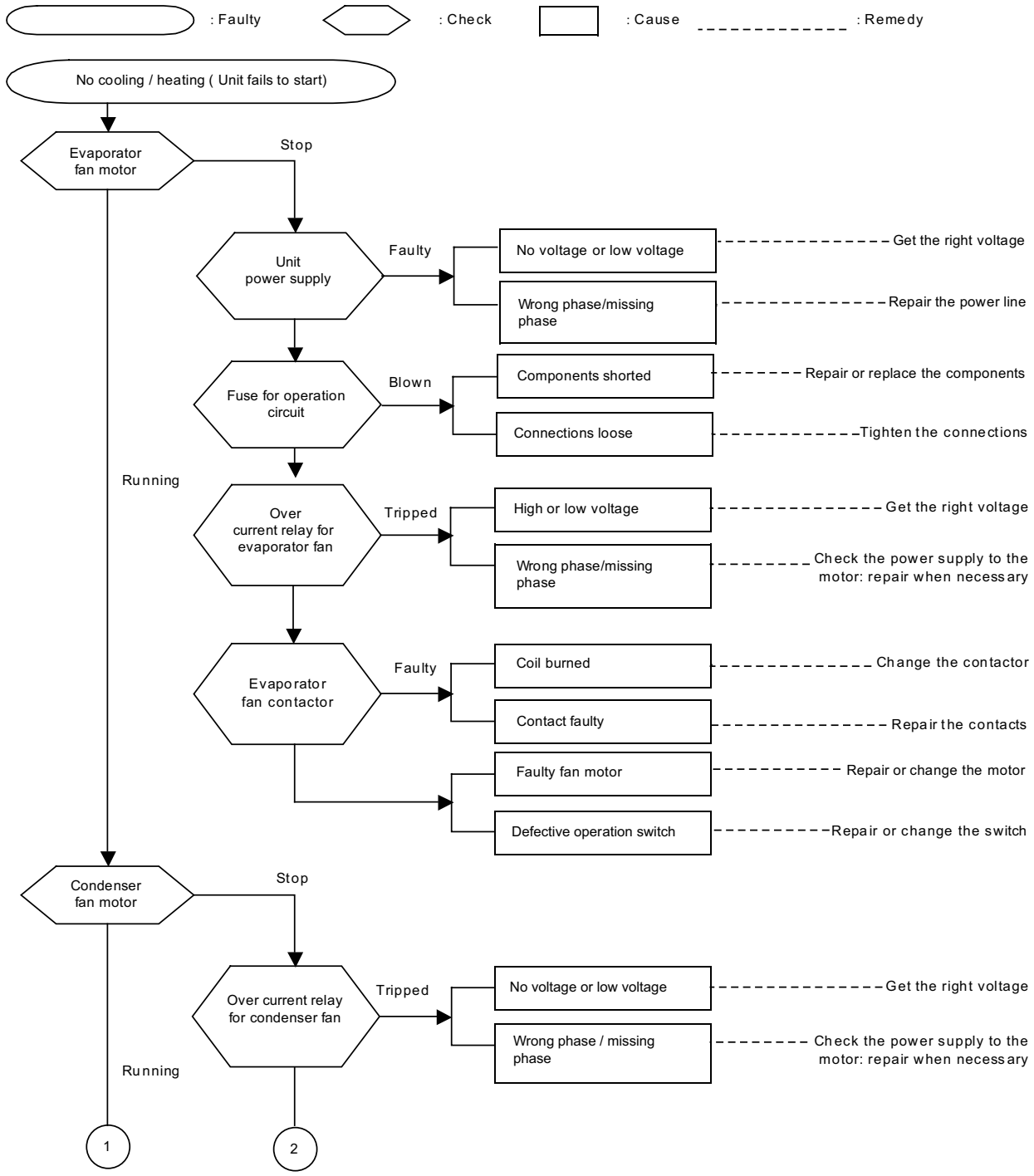
By means of pressure readings:

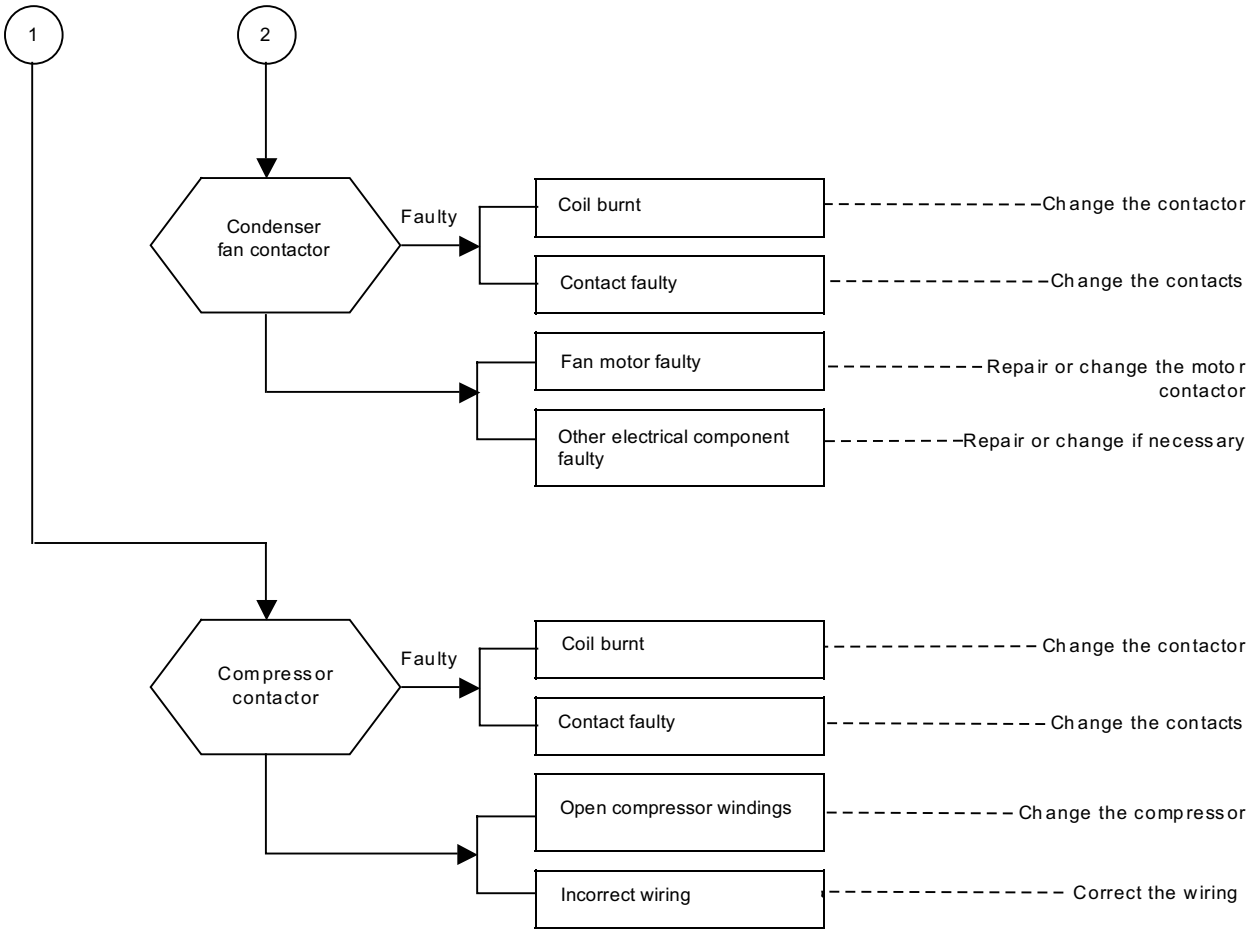
Data / Circuit	Pressure					Probable cause
	Too Low	A Little Low	Normal	A Little High	Too High	
High side Low side					• •	• Overcharged with refrigerant. • Non-condensable gases in refrigerant circuit (e.g. air) • Obstructed air-intake / discharge. • Hot air short circuiting in outdoor unit.
High side Low side	•				•	• Poor compression / no compression (compressor defective) • Reversing valve leaking.
High side Low side	•	•				• Undercharged with refrigerant. • Refrigerant leakage. • Air filter clogged / dirty (indoor unit). • Indoor fan locked / seized. • Defective defrost control, outdoor coil freeze up (heating). • Outdoor fan locked / seized (heating).
High side Low side				•	•	• Outdoor fan blocked (cooling). • Outdoor coil dirty (cooling). • Indoor fan locked / seized (heating). • Indoor air filter clogged / dirty (heating). • Non-condensable gases in refrigerant circuit (e.g. air)
High side Low side				•	•	• Air intake temperature of indoor unit too high.

By means of diagnostic flow chart:

Generally, there are two kinds of problems, i.e. starting failure and insufficient cooling/heating. “Starting failure” is caused by electrical defect while improper application or defects in refrigerant circuit causes “Insufficient cooling / heating”.

i) Diagnosis of Electric circuit



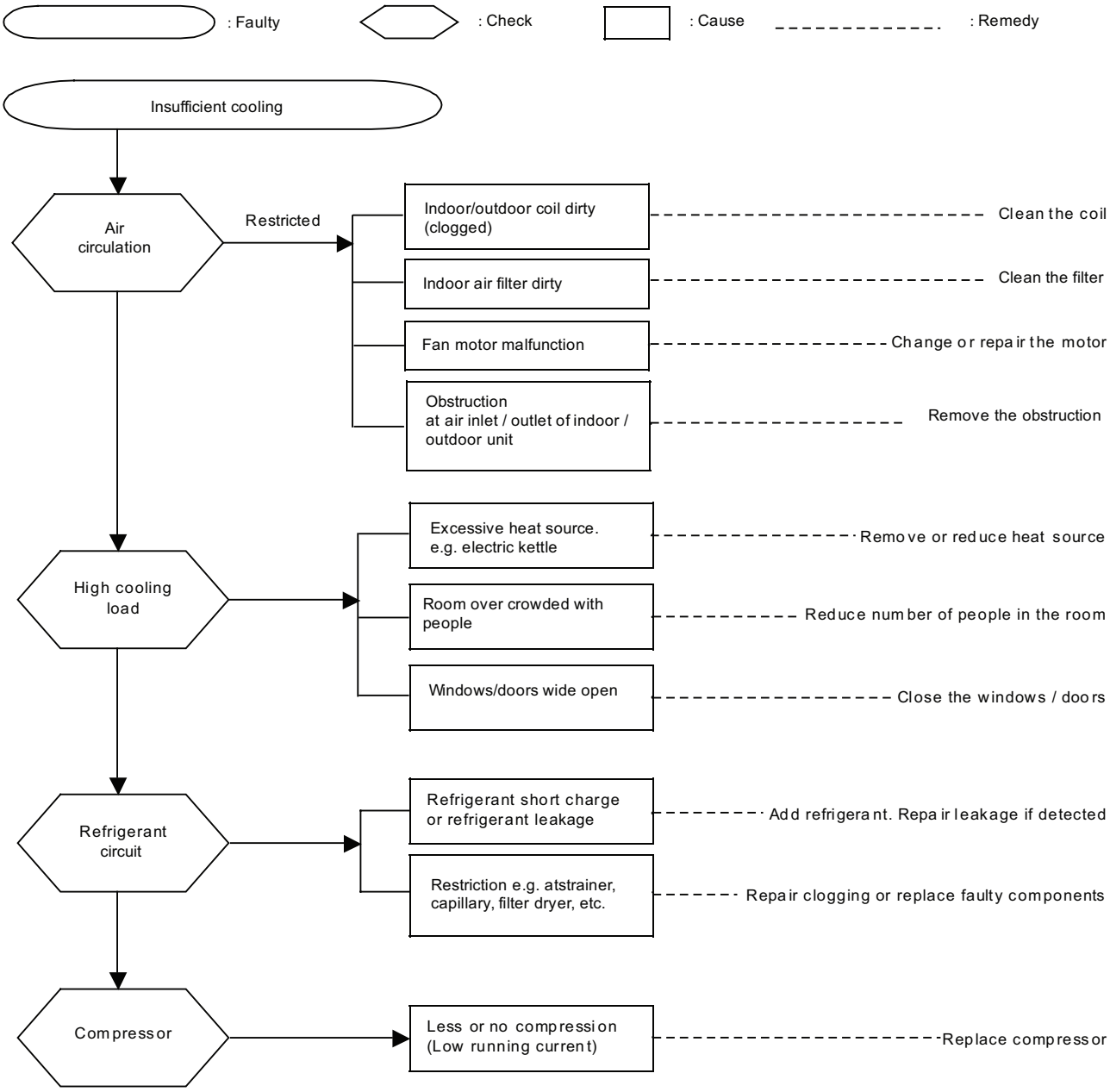


The most common causes of air conditioner failure to “start” are :

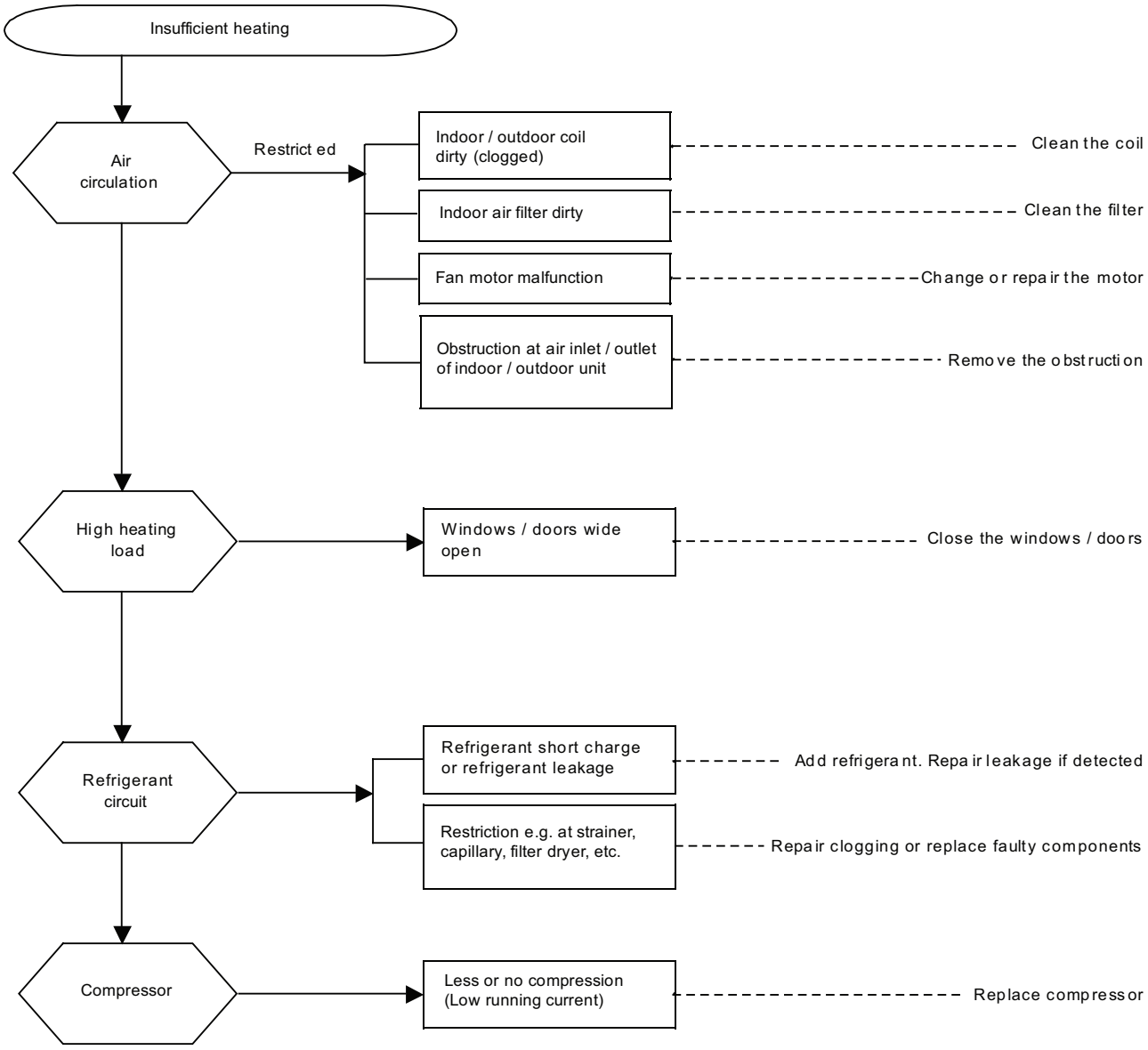
a) Voltage not within ±10% of rated voltage.
b) Power supply interrupted.
c) Improper control settings.
d) Air conditioner is disconnected from main power source.
e) Fuse blown or circuit breaker off.

ii) Diagnosis of Refrigerant Circuit / Application

There might be some causes where the unit starts running but does not perform satisfactorily, i.e. insufficient cooling. Judgement could be made by measuring temperature difference of indoor unit's intake and discharge air as well as running current.


: Faulty
: Check
: Cause
: Remedy
Insufficient cooling
Air circulation
Restricted
Indoor/outdoor coil dirty (clogged)
Clean the coil
Indoor air filter dirty
Clean the filter
Fan motor malfunction
Change or repair the motor
Obstruction at air inlet / outlet of indoor / outdoor unit
Remove the obstruction
High cooling load
Excessive heat source. e.g. electric kettle
Remove or reduce heat source
Room over crowded with people
Reduce number of people in the room
Windows/doors wide open
Close the windows / doors
Refrigerant circuit
Refrigerant short charge or refrigerant leakage
Add refrigerant. Repair leakage if detected
Restriction e.g. atstrainer, capillary, filter dryer, etc.
Repair clogging or replace faulty components
Compressor
Less or no compression (Low running current)
Replace compressor

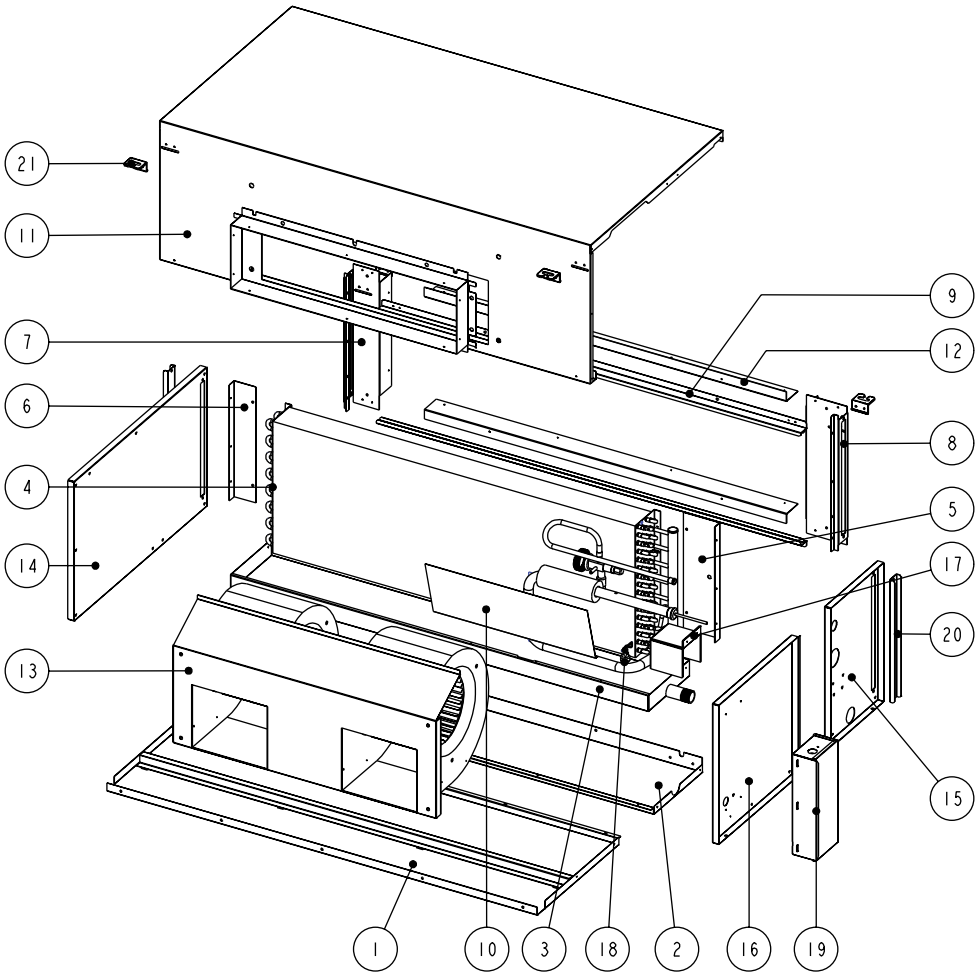
Satisfactory operation with temperature difference of air intake & discharge of indoor unit 8°C to 13°C . *
(* value is for reference only)


Insufficient heating
Air circulation
Restricted
Indoor / outdoor coil dirty (clogged)
Clean the coil
Indoor air filter dirty
Clean the filter
Fan motor malfunction
Change or repair the motor
Obstruction at air inlet / outlet of indoor / outdoor unit
Remove the obstruction
High heating load
Windows / doors wide open
Close the windows / doors
Refrigerant circuit
Refrigerant short charge or refrigerant leakage
Add refrigerant. Repair leakage if detected
Restriction e.g. at strainer, capillary, filter dryer, etc.
Repair clogging or replace faulty components
Compressor
Less or no compression (Low running current)
Replace compressor

Satisfactory operation with temperature difference of air intake & discharge of indoor unit 14°C to 20°C . *
(* value is for reference only)

Exploded View & Part List

Model: MCC 075D/DR



No	Description	Part No
1	Assy, Panel Front Base	R50014076024
2	Panel, Back Base	R01014074050
3	Assy, Drain Pan	R50019023584
4	Assy, Coil Tubing	
	MCC 075D	R50024078270
	MCC 075DR	R50024074055
5	Cover, Coil Right	R01014073369
6	Cover, Coil Left	R01014073370
7	Flange, Filter Right	R01014073811
8	Flange, Filter Left	R01014073810
9	Rail, Filter (CC075D/DR)	R12014076976
10	Drain Pan Seperator	R01014077402
11	Assy, Panel Top	R50014073371
12	Flange, Filter T/B	R01014074120
13	Assy, Fan Deck	R50034074053
14	Panel, Side Left	R01014073368
15	Panel, Header Small Right	R01014073366

No	Description	Part No
16	Panel, Side Big Right	R01014073365
17	Bracket, Drain Pump Cover	R01014077181
18	Switch, Level	R04069022966
19	Assy. Terminal Box	
	MCC 075D	R50044080388
	MCC 075DR	R50044076981
20	Cover, Filter L/R	R01014074119
21	Hanger	R01014032372
Parts Not Shown in Diagram		
	Handset, Wired Netware3 MCQUAY	R04089023825
	Control Module	
	MCC 075D	R04089025212
	MCC 075DR	R04089023681
	Air Filter	R03084076998
	Valve, TXV	
	MCC 075D	R05019015343
	MCC 075DR	R05019022121

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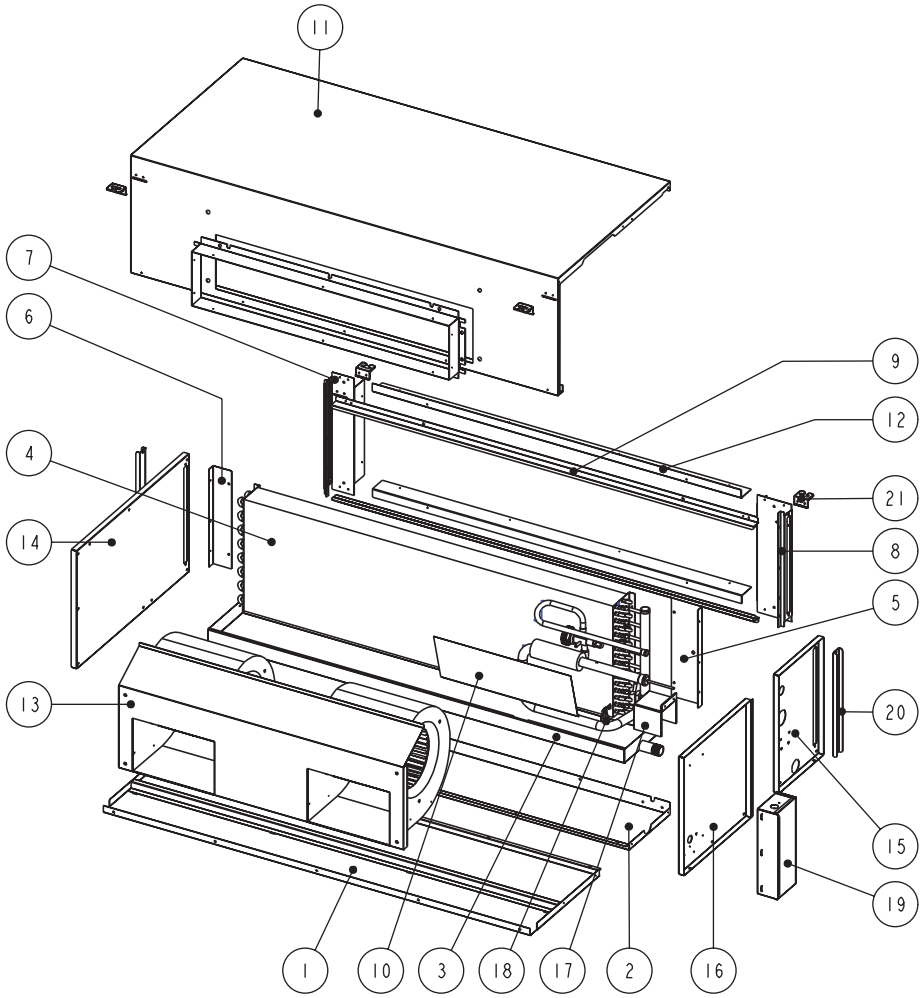
Model: MCC 100D/DR



No	Description	Part No
1	Assy, Panel Front Base	R50014076025
2	Panel, Back Base	R01014073346
3	Assy, Drain Pan	R50019023585
4	Assy, Coil Tubing	
	ACC 100D	R50024078271
	ACC 100DR	R50024073351
5	Cover, Coil Right	R01014073369
6	Cover, Coil Left	R01014073370
7	Flange, Filter Right	R01014073811
8	Flange, Filter Left	R01014073810
9	Rail, Filter (CC100D/DR)	R12014076977
10	Drain Pan Seperator	R01014077402
11	Assy, Panel Top	R50014074594
12	Flange, Filter T/B	R01014073812
13	Assy, Fan Deck	R50034073347
14	Panel, Side Ledt	R01014073368
15	Panel, Header Small Right	R01014073366

No	Description	Part No
16	Panel, Side Big Right	R01014073365
17	Bracket, Drain Pump Cover	R01014077181
18	Switch, Level	R04069022966
19	Assy. Terminal Box	
	MCC 100D	R50044080388
	MCC 100DR	R50044076981
20	Cover, Filter L/R	R01014074119
21	Hanger	R01014032372
Parts Not Shown in Diagram		
	Handset, Wired Netware3 MCQUAY	R04089023825
	Control Module	
	MCC 100D	R04089025212
	MCC 100DR	R04089023681
	Air Filter	R03084076997
	Valve, TXV	
	MCC 100D	R05019015344
	MCC 100DR	R05019022121

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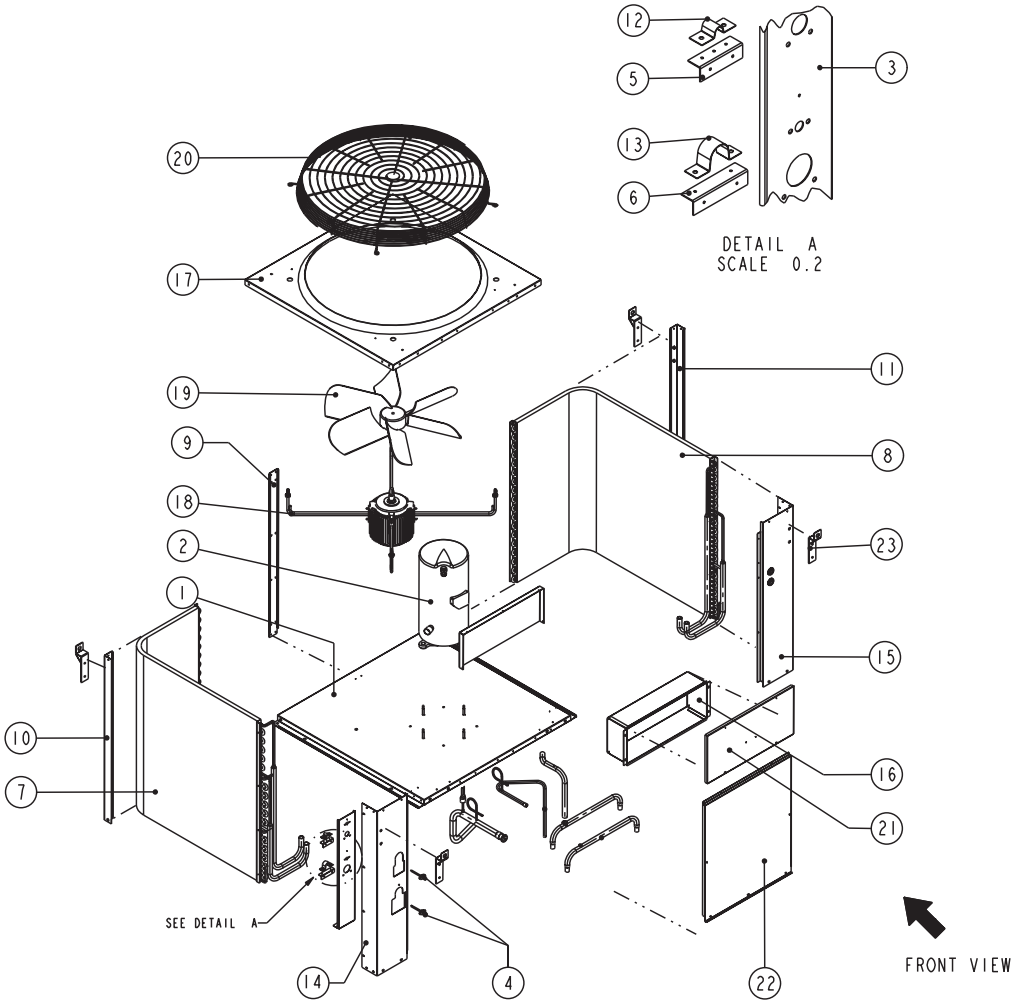
Model: MMC / M4MC 075/100D



NO.	DESCRIPTION	PART NO.
1	ASSY, BASE PAN	R50014045044
2	COMPRESSOR	
	MMC 075D	R50049004676
	M4MC 075D	R50049014526
	MMC 100D	R50049004677
	M4MC 100D	R50049014427
3	STRUC. TUBE SUPT	
	MMC / M4MC 075D	R01014044386
	MMC / M4MC 100D	R01014046135
4	ASSY, ACCESS VALVE	
	MMC 075/100D	R50054028348
	A4MC 75/100D	A05019023909
5	SUPT, TUBE LIQUID	
	MMC / M4MC 075D	R01014024023
	MMC / A4MC 100D	A01014023152
6	SUPT, TUBE GAS	
	MMC / M4MC 075D	R01014024026
	MMC / M4MC 100D	A01014024027
7	ASSY, COIL L	
	MMC / M4MC 075D	R50024044767
	MMC / M4MC 100D	R50024044774
8	ASSY, COIL R	
	MMC / M4MC 075D	R50024044769
	MMC / M4MC 100D	R50024044776
9	STRUC, COIL	R01014022392

NO.	DESCRIPTION	PART NO.
10	ASSY, STRUC. BACK L	R50014022910
11	ASSY, STRUC. BACK R	R50014029795
12	CLAMP, TUBE LIQUID	
	MMC / M4MC 075D	R01014024030
	MMC / M4MC 100D	R01014023149
13	CLAMP, TUBE GAS	
	MMC / M4MC 75D	R01014024033
	MMC / M4MC 100D	R01014024034
14	STRUC, FRONT L	R01014069646
15	STRUC, FRONT R	R01014069647
16	COVER, TER. BOARD BACK	R50014083905
17	PANEL, ORIFICE	R01014044211
18	MOTOR	R03039012606
19	PROPELLER FAN	R03019021351
20	FAN GUARD	R01024048691
21	PANEL, SERVICE TOP	R01014069644
22	PANEL, SERVICE BOTTOM	R01014069645
23	ASSY, S. HOISTING BRACKET	R50014022906
Parts Not In Diagram		
	LOW PRESS SWITCH	R04109015125
	HIGH PRESS SWITCH	
	MMC 075/100D	R04109015136
	M4MC 075/100D	R04109018820
	BRACKET, FAN MOTOR	R01024048601
	PHASE PROTECTOR PP1.03	R04089017029

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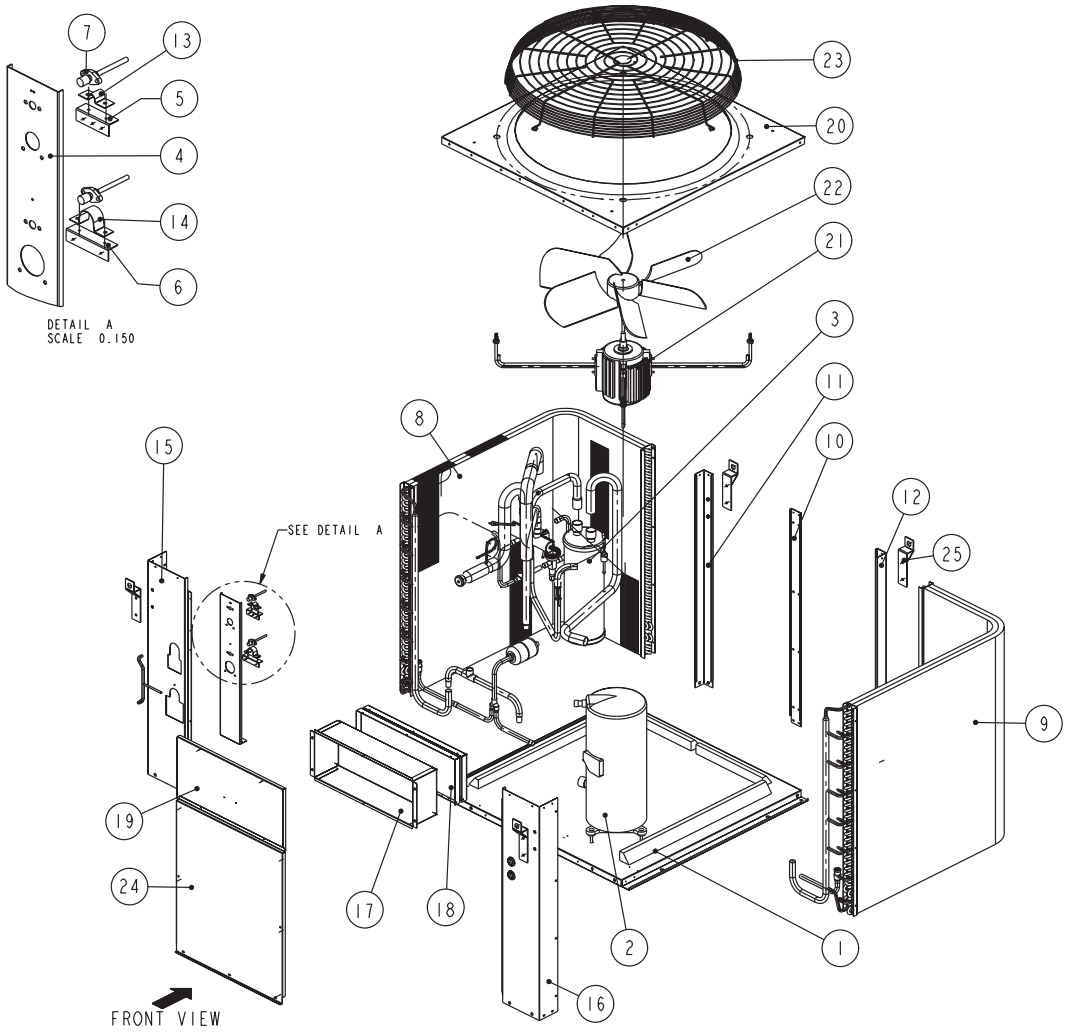
Model: MMC / M4MC 075/100ER



NO.	DESCRIPTION	PART NO.
1	ASSY, BASE PAN	R50014046841
2	COMPRESSOR	
	MMC 075ER	R50049004676
	M4MC 75ER	R50049014526
	MMC 100ER	R50049004677
	M4MC 100ER	R50049014427
3	ACCUMULATOR	
	MMC / M4MC 075ER	R02119015245
	MMC / M4MC 100ER	R02119015246
4	STRUC, TUBE SUPT.	
	MMC / M4MC 075ER	R01014044386
	MMC / M4MC 100ER	R01014046135
5	SUPT, LIQUID TUBE	
	MMC / M4MC 075ER	R01014024023
	MMC / M4MC 100ER	R01014023152
6	SUPT, GAS TUBE	
	MMC / M4MC 075ER	R01014024026
	MMC / M4MC 100ER	R01014024027
7	ASSY, ACCESS VALVE	
	MMC 075/100ER	R50054009748
	M4MC 075/100ER	R05019023816
8	ASSY, COIL L	
	MMC / M4MC 075ER	R50024052994
	MMC / M4MC 100ER	R50024053124
9	ASSY, COIL R	
	MMC / M4MC 075ER	R50024052995
	MMC / M4MC 100ER	R50024053125
10	STRUC, COIL	R01014022392

NO.	DESCRIPTION	PART NO.
11	STRUC, BACK L	R50014022910
12	STRUC, BACK R	R50014029795
13	CLAMP, LIQUID TUBE	
	MMC / M4MC 075ER	R01014024030
	MMC / M4MC 100ER	R01014023149
14	CLAMP, GAS TUBE	
	MMC / M4MC 075ER	R01014024033
	MMC / M4MC 100ER	R01014024034
15	STRUC, FRONT L	R01014069646
16	STRUC, FRONT R	R01014069647
17	TER. BOARD	
	MMC / M4MC 075ER	R50044083924
	MMC / M4MC 100ER	R50044083925
18	COVER, TER. BOARD BACK	R01014083897
19	PANEL, SERVICE TOP	R01014069644
20	PANEL, ORIFICE	R01014044211
21	MOTOR	R03039012606
22	FAN PROPELLER	R03019021351
23	FAN GUARD	R01024048691
24	PANEL, SERVICE BOTTOM	R01014069645
25	ASSY, S. HOISTING BRACKET	R50014022906
Parts Not In Diagram		
	LOW PRESS SWITCH	R04109015125
	HIGH PRESS SWITCH	
	MMC 075/100ER	R04109015136
	M4MC 075/100ER	R04109018820
	PHASE PROTECTOR PP1.03	R04089017029

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